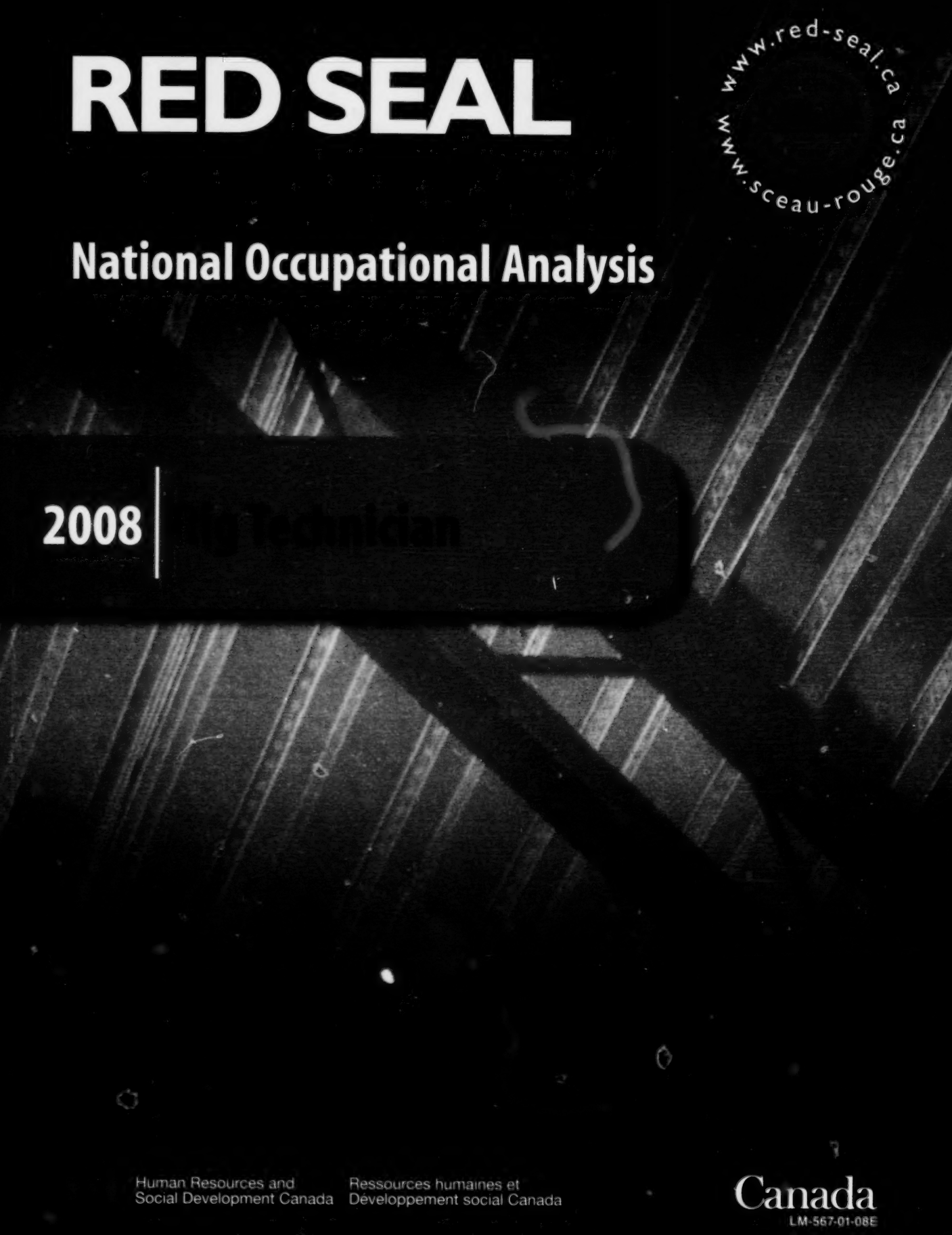
RED SEAL

www.red-seal.ca
www.sceau-rouge.ca

National Occupational Analysis



2008 | Technician

Human Resources and Social Development Canada
Ressources humaines et Développement social Canada

Canada

LM-567-01-08E

2008-02881/

Occupational Analyses Series

Rig Technician

2008

Trades and Apprenticeship Division	Division des métiers et de l'apprentissage
Workplace Partnerships Directorate	Direction des partenariats en milieu de travail
National Occupational Classification:	8232
Disponible en français sous le titre :	Technicien/technicienne en forage (pétrolier et gazier)

©Her Majesty the Queen in Right of Canada, 2008
Cat. No.: HS42-1/16-2008E
ISBN 978-0-662-47647-4

The Canadian Council of Directors of Apprenticeship (CCDA) recognizes this National Occupational Analysis as the national standard for the occupation of Rig Technician.

Background

The first National Conference on Apprenticeship in Trades and Industries, held in Ottawa in 1952, recommended that the federal government be requested to cooperate with provincial and territorial apprenticeship committees and officials in preparing analyses of a number of skilled occupations. To this end, Human Resources and Social Development Canada (HRSDC) sponsors a program, under the guidance of the CCDA, to develop a series of national occupational analyses.

The National Occupational Analyses have the following objectives:

- to describe and group the tasks performed by skilled workers;
- to identify which tasks are performed in every province and territory;
- to develop instruments for use in the preparation of Interprovincial Red Seal Examinations and curricula for training leading to the certification of skilled workers;
- to facilitate the mobility of apprentices and skilled workers in Canada; and,
- to supply employers, employees, associations, industries, training institutions and governments with analyses of occupations.

The Canadian Council of Directors of Apprenticeship (CCDA) and Human Resources and Social Development Canada (HRSDC) wish to express sincere appreciation for the contribution of the many tradespersons, industrial establishments, professional associations, labour organizations, provincial and territorial government departments and agencies, and all others who contributed to this publication.

Special acknowledgement is extended to the following representatives from the trade.

Neil Alexander	Alberta
Kevin Antonick	Saskatchewan
Tim Croston	British Columbia
Doug Hadley	Manitoba
Darcy Moore	Canadian Association of Oilwell Drilling Contractors (CAODC)
John Orvis	Manitoba
Greg Rutten	Saskatchewan
Darwin Unrau	Canadian Association of Oilwell Drilling Contractors (CAODC)
Cory Zimmer	Alberta

This analysis was prepared by the Workplace Partnerships Directorate of HRSDC. The coordinating, facilitating and processing of this analysis were undertaken by employees of the National Occupational Analysis (NOA) development team of the Trades and Apprenticeship Division. Erik Schmidt for the host jurisdiction of Alberta also participated in the development of this NOA. The NOA development team thanks Nancy Malone from the CAODC for her contribution to the development of the NOA.

FOREWORD I

ACKNOWLEDGEMENTS II

TABLE OF CONTENTS III

LIST OF PUBLISHED NATIONAL OCCUPATIONAL ANALYSES V

STRUCTURE OF ANALYSIS VII

DEVELOPMENT AND VALIDATION OF ANALYSIS VIII

ANALYSIS

SAFETY 3

SCOPE OF THE RIG TECHNICIAN TRADE 4

OCCUPATIONAL OBSERVATIONS 6

BLOCK A **OCCUPATIONAL SKILLS**

Task 1 Maintains and uses tools and equipment. 7

Task 2 Organizes work. 9

Task 3 Uses documentation and reports. 12

Task 4 Supervises and trains crew members. 15

BLOCK B **RIG MOVES**

Task 5 Disassembles rig. 18

Task 6 Assembles rig. 19

BLOCK C **RIG UP**

Task 7 Performs rig up procedures. 22

Task 8 Prepares for drilling operations. 27

BLOCK D **RIG INSPECTION AND MAINTENANCE**

Task 9 Inspects rig equipment. 31

Task 10 Maintains rig equipment. 33

BLOCK E	**DRILLING OPERATIONS**		
	Task 11	Prepares drill string.	40
	Task 12	Installs blowout preventer (BOP).	42
	Task 13	Performs drilling activities.	44
	Task 14	Performs tripping activities.	47
	Task 15	Performs casing activities.	50
	Task 16	Performs specialized drilling operations.	53
	Task 17	Performs specialized well operations.	55
BLOCK F	**RIG OUT**		
	Task 18	Performs rig out procedures.	60
	Task 19	Prepares for rig move.	65

APPENDICES

APPENDIX A	**TOOLS AND EQUIPMENT**	69
APPENDIX B	**GLOSSARY**	71
APPENDIX C	**ACRONYMS**	73
APPENDIX D	**BLOCK AND TASK WEIGHTING**	75
APPENDIX E	**PIE CHART**	79
APPENDIX F	**TASK PROFILE CHART**	81

LIST OF PUBLISHED NATIONAL OCCUPATIONAL ANALYSES (Red Seal Trades)

TITLE	NOC* Code
Agricultural Equipment Technician (2007)	7312
Appliance Service Technician (2005)	7332
Automotive Painter (2005)	7322
Automotive Service Technician (2005)	7321
Baker (2006)	6252
Boilermaker (2003)	7262
Bricklayer (2007)	7281
Cabinetmaker (2007)	7272
Carpenter (2005)	7271
Concrete Finisher (2006)	7282
Construction Electrician (2003)	7241
Cook (2003)	6242
Electrical Rewind Mechanic (1999)	7333
Electronics Technician – Consumer Products (1997)	2242
Floorcovering Installer (2005)	7295
Glazier (2004)	7292
Hairstylist (2005)	6271
Heavy Duty Equipment Technician (2004)	7312
Industrial Electrician (2003)	7242
Industrial Mechanic (Millwright) (2007)	2243
Instrumentation and Control Technician (2007)	7311
Insulator (Heat and Frost) (2007)	7293
Ironworker (Generalist) (2006)	7264
Ironworker (Reinforcing) (2006)	7264
Ironworker (Structural/Ornamental) (2006)	7264
Lather (Interior Systems Mechanic) (2007)	7284
Machinist (2005)	7231

* National Occupational Classification

TITLE	NOC* Code
Metal Fabricator (Fitter) (2003)	7263
Mobile Crane Operator (2006)	7371
Motorcycle Mechanic (2006)	7334
Motor Vehicle Body Repairer (Metal and Paint) (2005)	7322
Oil Burner Mechanic (2006)	7331
Painter and Decorator (2007)	7294
Partsperson (2005)	1472
Plumber (2003)	7251
Powerline Technician (2004)	7244
Recreation Vehicle Service Technician (2006)	7383
Refrigeration and Air Conditioning Mechanic (2004)	7313
Roofer (2006)	7291
Rig Technician (2008)	8232
Sheet Metal Worker (2006)	7261
Sprinkler System Installer (2003)	7252
Steamfitter – Pipefitter (2007)	7252
Tilesetter (2004)	7283
Tool and Die Maker (2005)	7232
Transport Trailer Technician (2003)	7321
Truck and Transport Mechanic (2007)	7321
Welder (2004)	7265

Requests for these National Occupational Analyses may be forwarded to:

Trades and Apprenticeship Division
Workplace Partnership Directorate
Human Resources and Social Development Canada
140 Promenade du Portage, Phase IV, 5th Floor
Gatineau, Quebec K1A 0J9

These publications are also available to order or download online at: www.red-seal.ca. Links to Essential Skills Profiles for some of these trades are available on this website.

To facilitate understanding of the occupation, the work performed is divided into the following categories:

Block	the largest division within the analysis which reflects a distinct set of operations relevant to the occupation.
Task	the distinct activity that, combined with others, makes up the logical and necessary steps the worker is required to perform in a block.
Sub-Task	the smallest division of work activities that, combined together, fully describe all duties of a task.
Supporting Knowledge and Abilities	the elements of skill and knowledge that an individual must acquire to adequately perform a sub-task.

Information on the following areas of this occupation is also provided throughout the analysis:

Trends	any shifts or changes in technology that affect the block.
Context	statements written to clarify the intent and meaning of tasks.
Related Components	components related to a specified task being undertaken.
Tools and Equipment	types of tools and equipment necessary to perform the work on all given tasks identified within the block. More detailed lists of these types are shown in Appendix A.

The appendices located at the end of the analysis are described as follows:

Appendix A – Tools and Equipment	a non-exhaustive list of tools and equipment used in this trade.
Appendix B – Glossary	definitions or explanations for terms used in this analysis.
Appendix C – Acronyms	a list of acronyms used in this analysis with their full name.
Appendix D – Block and Task Weighting	the block and task percentages as submitted by each jurisdiction at the validation stage and the national averages of these percentages.
Appendix E – Pie Chart	a graph which depicts the national percentages assigned to blocks.
Appendix F – Task Profile Chart	a chart which outlines graphically the blocks, tasks and sub-tasks of this analysis.

Development of Analysis

A draft analysis is developed by a committee of industry experts in the field led by a team of facilitators from HRSDC. This draft analysis breaks down all the tasks performed in the occupation and describes the knowledge and abilities required for a tradesperson to demonstrate competence in the trade.

The NOA development team then forwards a copy of the analysis and its translation to provincial/territorial authorities for a review of its content and structure. Their recommendations are assessed and incorporated into the analysis.

Validation and Weighting Method

This copy of the analysis is sent to all provinces/territories for validation and weighting. Each jurisdiction validates the document with the use of a provincial/territorial trade advisory committee. They examine the blocks, tasks and sub-tasks of the analysis:

BLOCKS Each committee assigns percentages to blocks based on the number of questions that they would assign for each block on a hundred question examination of the entire trade.

TASKS Each committee assigns percentages to tasks based on the number of questions that would be assigned to each task on a hundred question examination for its block.

SUB-TASKS Sub-tasks are examined by each committee and they indicate with a YES or NO whether or not each sub-task is performed by the skilled workers within the occupation in their jurisdiction.

The results of this exercise are submitted to the NOA development team who then analyzes the data and incorporates it into the document. The analysis provides the individual jurisdictional validation results as well as the national averages of all responses. The national averages for block and task weighting provide guidelines for the development of the Interprovincial Red Seal Examination for the trade.

This method for the validation of the National Occupational Analysis also identifies common core sub-tasks across Canada for the occupation. If at least 70% of the responding jurisdictions perform a sub-task, it shall be considered common core. Interprovincial Red Seal Examinations are based on the common core sub-tasks identified through this validation process.

Definitions for Validation and Weighting

YES	sub-task is performed by qualified workers in the occupation in a specific jurisdiction.
NO	sub-task is not performed by qualified workers in the occupation in a specific jurisdiction.
NV	Not Validated by a province/territory.
ND	Not Designated in a province/territory.
NOT COMMON CORE (NCC)	sub-task, task or block is performed by less than 70% of responding jurisdictions; these are not to appear on the Interprovincial Red Seal Examination for this trade.
BLOCK %	the average percentage of questions that will be placed on an Interprovincial Red Seal Examination to assess each block of the analysis.
TASK %	the average percentage of questions that will be placed on an Interprovincial Red Seal Examination to assess each task of the analysis.

Provincial/Territorial Abbreviations

NL	Newfoundland and Labrador
NS	Nova Scotia
PE	Prince Edward Island
NB	New Brunswick
QC	Quebec
ON	Ontario
MB	Manitoba
SK	Saskatchewan
AB	Alberta
BC	British Columbia
NT	Northwest Territories
YT	Yukon Territory
NU	Nunavut

ANALYSIS

Safe working procedures and conditions, accident prevention, and the preservation of health are of primary importance to industry in Canada. These responsibilities are shared and require the joint efforts of government, employers and employees. It is imperative that all parties become aware of circumstances that may lead to injury or harm. Safe learning experiences and work environments can be created by controlling the variables and behaviours that may contribute to accidents or injury.

It is generally recognized that safety-conscious attitudes and work practices contribute to a healthy, safe and accident-free work environment.

It is imperative to apply and be familiar with the Occupational Health and Safety Acts (OH&S) and Workplace Hazardous Materials Information System (WHMIS) Regulations. As well, it is essential to determine workplace hazards and take measures to protect oneself, co-workers, the public and the environment.

Safety education is an integral part of training in all jurisdictions. As safety is an imperative part of all trades, it is assumed and therefore it is not included as a qualifier of any activities. However, the technical safety tasks and sub-tasks specific to the trade are included in this analysis.

SCOPE OF THE RIG TECHNICIAN TRADE

"Rig technician" is this trade's official Red Seal occupational title approved by the CCDA. This analysis covers tasks performed by rig technicians whose occupational title has been identified by some provinces and territories of Canada under the following names:

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
Rig Technician								✓	✓	✓	✓		

Drilling is an important phase of oil exploration and extraction in Canada. Drilling is one of the methods used to access hydrocarbon formations. Rig technicians work on drilling rigs and other specialized equipment to drill holes to retrieve these hydrocarbons.

Drilling rigs are owned by companies specializing in drilling, called drilling contractors. Some contractors are larger than others and some specialize in certain types of operations. However, all contractors offer their drilling equipment and the services of their employees to exploration companies on a contract basis.

A rig crew's operational structure is organized by a clearly defined set of duties and responsibilities. After gaining entry level experience as a leasehand and floorhand, workers in this trade must progress through the ranks of motorhand (level 1) and derrickhand (level 2) in order to become fully qualified rig technicians (level 3). The division of duties in the levels of skilled workers on a rig crew is:

> ***Motorhands***: maintain drilling rig engines, transmissions, heating systems, diesel electric generators and motors, hydraulic systems and other mechanical equipment; maintain equipment logs and records; monitor fluid and supply levels; participate in rig mobilization (rig up) and demobilization (rig out); supervise and are able to do all duties performed by floorhands and leasehands.
>
> ***Derrickhands***: operate drilling fluid systems and pumps during drilling; mix chemicals and additives; handle sections of the drill string assembly from the monkeyboard during tripping operations; monitor and record volume and properties of drilling fluids; supervise motorhands, floorhands and leasehands; and are able to do all duties performed by motorhands.
>
> ***Rig technicians (drillers)***: operate the drawworks, rotary equipment and pumps; inspect rig; maintain records of drilling operations; are able to perform all duties performed by any crew member; and are responsible for the safety, training and supervision of the crew members.

Rig technicians (drillers) report directly to the drilling rig manager. The scope of the rig technician for this analysis covers the duties of motorhands, derrickhands and drillers.

A rig crew works with a variety of hand and power tools, as well as motorized equipment, lifting and hoisting equipment, and personal protective and safety equipment. Computers are an important tool in this trade to maintain operational records and interpret data related to drilling activities.

The rig is set up and transported to different sites resulting in the rig crew often travelling to remote locations. The work is performed in all weather conditions and workers should be prepared to work in all types of weather and environmental conditions (example: cold, hot, noisy, dirty, dusty, wet and muddy). Drilling activity peaks during the winter months when the ground is frozen. The work pressures and demands may fluctuate depending on world oil and gas supply and demand.

Important attributes for rig technicians are the ability to work well in a team, and strong leadership, communication, and organizational skills. Good physical condition is important because the work often requires considerable lifting, long hours and repetitive movement. There are also considerations related to working long periods of time in isolated areas away from home.

Drilling is a 24-hour operation, requiring rig technicians to work shifts. The job requires mental alertness due to the inherent work hazards such as moving equipment, exposure to chemicals and working at heights.

Rig technicians are expected to perform supervisory duties and training of apprentices and other less experienced crew members. Experienced rig technicians may move into other positions such as rig managers, instructors, well site supervisors, sales representatives or other technical positions within the industry.

Multi-well pads, swamp mats and fibre roads are increasingly used to allow better access to drilling areas that were previously difficult to access. This increases the length of the drilling season, making year-round drilling possible.

New technologies are offering new choices of bits, drilling fluids and downhole tools, which increase the speed at which wells are drilled. Also, new types of drilling rigs are being built, such as automatic drilling rigs (ADR), which change the nature of the work being done by rig technicians. Much of the hands-on work on a traditional rig is replaced by automatic systems on the ADR. This increases the safety of the operations.

New regulations and company policies are impacting drilling rig management and crews, especially in the areas of due diligence, liability issues and safety training. Pre-job hazard assessments (PJHAs), job safety analysis (JSAs) and specific task training are becoming increasingly important. To prove due diligence, there are ever increasing demands regarding the documentation of these meetings.

There is an increasing importance being placed on communication and leadership skills. As part of these skills, computer literacy, the ability to train junior crew members, and the ability to work in a team environment, are becoming highly valued qualities in this trade.

Trends

Rig technicians increasingly rely on computers to record and transfer information.
There is more industry information available in the form of manuals and other printed material.
There is an increasing emphasis on safety standards and policies.
There is more use of tanks and related equipment to contain and reuse drilling fluids for environmental purposes.

Related Components

All components apply.

Tools and Equipment

See Appendix A.

Task 1 Maintains and uses tools and equipment.

Context

Rig technicians must use tools and equipment to perform most tasks in their trade.

Sub-task 1.01 Maintains hand and power tools.

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	ND	NV	ND	ND	ND	ND	yes	yes	yes	NV	ND	ND

Supporting Knowledge & Abilities

1.01.01	knowledge of types of hand tools such as wrenches, hammers and chain tongs
1.01.02	knowledge of types of power tools such as electric drills, chop saws and grinders
1.01.03	knowledge of power tool accessories such as wire wheels, grinding discs and drill bits
1.01.04	knowledge of limitations of use of hand and power tools
1.01.05	ability to organize hand and power tools

1.01.06	ability to store hand and power tools
1.01.07	ability to clean, service and lubricate hand and power tools
1.01.08	ability to recognize worn, damaged or defective hand and power tools

---

Sub-task
1.02 **Uses mobile equipment.**

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	ND	NV	ND	ND	ND	ND	yes	yes	yes	NV	ND	ND

Supporting Knowledge & Abilities

1.02.01	knowledge of types of mobile equipment such as crew trucks and loaders
1.02.02	knowledge of operating requirements for mobile equipment
1.02.03	ability to perform basic maintenance according to manufacturers' specifications
1.02.04	ability to operate mobile equipment
1.02.05	ability to identify problems on mobile equipment such as leaking hoses and flat tires

---

Sub-task
1.03 **Uses manual rigging equipment.**

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	ND	NV	ND	ND	ND	ND	yes	yes	yes	NV	ND	ND

Supporting Knowledge & Abilities

1.03.01	knowledge of manual rigging equipment such as come-alongs, chain hoists, chains and slings
1.03.02	knowledge of applications and limitations of manual rigging equipment
1.03.03	knowledge of sling configurations such as basket, choke and belly
1.03.04	ability to recognize tags on slings to identify load limits
1.03.05	ability to recognize safe lifting locations or points
1.03.06	ability to recognize potential hazards such as pinch points and wet surfaces
1.03.07	ability to recognize worn, damaged or defective manual rigging equipment

Sub-task

1.04 **Uses personal protective equipment (PPE) and safety equipment.**

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	ND	NV	ND	ND	ND	ND	yes	yes	yes	NV	ND	ND

Supporting Knowledge & Abilities

1.04.01	knowledge of types of PPE such as respiratory, hearing, eye and body protection
1.04.02	knowledge of self-contained breathing apparatus and supplied air systems
1.04.03	knowledge of types of gas detectors such as electronic, piston and personal
1.04.04	knowledge of types of safety equipment such as fall arrest, burn kits, eye wash station, fire extinguishers, stretchers and first aid kit
1.04.05	knowledge of types of fall arrest equipment such as lanyards, derrick belts and carabineers
1.04.06	knowledge of first aid certification requirements
1.04.07	knowledge of workplace safety and health regulations such as fall protection and Workplace Hazardous Materials Information System (WHMIS)
1.04.08	knowledge of rig rescue techniques using equipment such as rescue baskets, emergency escape devices, man-rated winches and rope knots
1.04.09	knowledge of location and operation of PPE and safety equipment
1.04.10	ability to recognize worksite hazards
1.04.11	ability to select fall arrest equipment
1.04.12	ability to locate tie off points for fall arrest and fall restraint equipment
1.04.13	ability to store PPE and safety equipment
1.04.14	ability to recognize worn, damaged or defective PPE and safety equipment
1.04.15	ability to fit and adjust PPE
1.04.16	ability to use emergency escape devices such as escape buggies and pods

Task 2 Organizes work.

Context Organizing work includes communicating effectively, working within the parameters of company policies and leading crew activities. Rig technicians must adhere to safety procedures and regulations.

Sub-task
2.01 **Communicates with others.**

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	ND	NV	ND	ND	ND	ND	yes	yes	yes	NV	ND	ND

Supporting Knowledge & Abilities

2.01.01	knowledge of oilfield terminology
2.01.02	knowledge of government and company policies, procedures, guidelines and standards
2.01.03	knowledge of verbal and written communication
2.01.04	ability to acquire information through questioning
2.01.05	ability to translate technical information into layperson's terms
2.01.06	ability to relay information to rig technicians on other shifts
2.01.07	ability to use communication equipment such as two way radios and rig phones
2.01.08	ability to communicate with other professionals, tradespersons and third-party contractors such as oil company consultants, electricians and directional drillers
2.01.09	ability to mentor apprentices
2.01.10	ability to use hand signals for hoisting and lifting
2.01.11	ability to explain memos and reports to crew members
2.01.12	ability to discuss performance with individual crew members

Sub-task
2.02 **Maintains parts and supply inventory.**

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	ND	NV	ND	ND	ND	ND	yes	yes	yes	NV	ND	ND

Supporting Knowledge & Abilities

2.02.01	knowledge of common rig supplies such as pump parts, oil filters and scrub brushes
2.02.02	ability to refer to equipment log books when maintaining inventory
2.02.03	ability to identify future need for rig supplies

2.02.04	ability to create a want list
2.02.05	ability to organize and store inventory

Sub-task
2.03 **Disposes of waste materials.**

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	ND	NV	ND	ND	ND	ND	yes	yes	yes	NV	ND	ND

Supporting Knowledge & Abilities

2.03.01	knowledge of types of waste materials such as used oil and filters, plastics, woods, metals and domestic garbage
2.03.02	knowledge of spill response actions
2.03.03	knowledge of industry and governmental regulations related to disposal of waste materials
2.03.04	ability to separate waste materials for disposal and recycling
2.03.05	ability to recognize products and how they can be disposed of
2.03.06	ability to recognize hazards of waste materials
2.03.07	ability to handle and store hazardous materials
2.03.08	ability to respond to and contain spills

Sub-task
2.04 **Maintains safe work environment.**

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	ND	NV	ND	ND	ND	ND	yes	yes	yes	NV	ND	ND

Supporting Knowledge & Abilities

2.04.01	knowledge of workers' rights and responsibilities
2.04.02	knowledge of company safety policies and procedures
2.04.03	knowledge of federal, provincial/territorial and municipal health and safety acts and regulations
2.04.04	knowledge of training requirements such as fall protection, confined space entry, and hoisting and rigging
2.04.05	knowledge of hazards associated with rig equipment
2.04.06	knowledge of H_2S hazards and response plan

2.04.07	knowledge of fire safety and work permit procedures
2.04.08	knowledge of housekeeping practices
2.04.09	knowledge of emergency procedures and location of on-site first aid stations and equipment
2.04.10	ability to locate and recognize safety documentation such as Material Safety Data Sheets (MSDS) and WHMIS labels
2.04.11	ability to recognize and report potential hazards
2.04.12	ability to install temporary safety protection such as lockouts and static lines

---

Sub-task 2.05 **Leads crew meetings.**

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	ND	NV	ND	ND	ND	ND	yes	yes	yes	NV	ND	ND

Supporting Knowledge & Abilities

2.05.01	knowledge of types of meetings such as pre-job, safety and orientation
2.05.02	knowledge of work permits such as hot work and confined space
2.05.03	knowledge of company and industry requirements for site orientation meetings
2.05.04	ability to identify when meetings are required
2.05.05	ability to schedule meetings
2.05.06	ability to refer to and utilize Job Safety Analysis (JSA)
2.05.07	ability to keep meeting on track and focused
2.05.08	ability to record and evaluate results of crew meetings

---

Task 3 Uses documentation and reports.

Context

It is critical that rig technicians use documentation to provide a record of the daily operations. Completion of documentation proves due diligence and enforces safe and proper operation of the rig.

Tour sheets are a regulatory requirement and allow the head office to track daily operations.

Sub-task

3.01 **Uses personnel documentation.**

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	ND	NV	ND	ND	ND	ND	yes	yes	yes	NV	ND	ND

Supporting Knowledge & Abilities

3.01.01	knowledge of company and jurisdictional policies and regulations related to personnel documentation
3.01.02	knowledge of probationary period procedures
3.01.03	ability to coordinate completion of documents with crew members
3.01.04	ability to complete personnel documentation such as orientation checklists, apprentice record books, personnel evaluations and incident reports
3.01.05	ability to interpret personnel documentation such as employee verification checklists

Sub-task

3.02 **Uses safety and environmental documentation.**

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	ND	NV	ND	ND	ND	ND	yes	yes	yes	NV	ND	ND

Supporting Knowledge & Abilities

3.02.01	knowledge of types of safety documentation such as inspection checklists, and pre-job and weekly safety meeting documents
3.02.02	knowledge of environmental documentation such as spill reports and waste disposal guidelines
3.02.03	knowledge of frequency of safety meetings and inspection checklists
3.02.04	knowledge of types of inspection checklists such as rig inspection, escape device and fall arrest
3.02.05	knowledge of regulatory and original equipment manufacturers (OEM) requirements for inspections
3.02.06	knowledge of rig inspection items such as breathing apparatus, emergency escape devices and fire extinguishers
3.02.07	ability to recognize hazards such as inadequate safety equipment, broken and missing pieces and incorrect assembly of equipment

3.02.08	ability to understand environmental impact of incidents
3.02.09	ability to complete safety and environmental documentation

---

Sub-task
3.03 **Completes tour sheets.**

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	ND	NV	ND	ND	ND	ND	yes	yes	yes	NV	ND	ND

Supporting Knowledge & Abilities

3.03.01	knowledge of information recorded on tour sheets such as bottom hole assembly (BHA), daily activities, meters drilled, mud reports and payroll
3.03.02	knowledge of daily activities recorded on tour sheets such as drilling, circulating, tripping and rig service
3.03.03	ability to keep track of time and activities
3.03.04	ability to interpret and transfer gauge readings such as pit volume totalizer (PVT), weight on bit (WOB) and pump pressure to tour sheets
3.03.05	ability to record information
3.03.06	ability to ensure that crew members are signed off at the end of tour/shift
3.03.07	ability to proofread input to the tour sheets
3.03.08	ability to reference prior tour sheets

Sub-task
3.04 **Interprets trade documentation.**

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	ND	NV	ND	ND	ND	ND	yes	yes	yes	NV	ND	ND

Supporting Knowledge & Abilities

3.04.01	knowledge of types of trade documentation such as Industry Recommended Practices (IRPs), first and second line well control documents, OEM documents and JSAs
3.04.02	knowledge of training and certification requirements such as well control, H_2S and confined space
3.04.03	ability to access trade documentation

3.04.04	ability to refer to trade documentation
3.04.05	ability to apply documentation to task

Task 4 — Supervises and trains crew members.

Context

Rig technicians are responsible for supervising crew members to ensure that they are doing their jobs safely and efficiently. New crew members must be oriented to the job site so that they transition into their job smoothly and can be a productive member of the team. Ongoing training is delivered by the rig technician to all crew members on subjects such as new tasks, safety procedures and their duties related to well control procedures.

Sub-task 4.01 — Supervises crew members.

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	ND	NV	ND	ND	ND	ND	yes	yes	yes	NV	ND	ND

Supporting Knowledge & Abilities

4.01.01	knowledge of crew members such as derrickhands, motorhands, floorhands and leasehands
4.01.02	knowledge of duties of each crew member
4.01.03	ability to identify crew members' abilities
4.01.04	ability to assign tasks to each crew member
4.01.05	ability to identify and rectify incorrect procedures
4.01.06	ability to coordinate crew members' actions
4.01.07	ability to ensure tasks are being performed according to company policy
4.01.08	ability to relay information to crew members
4.01.09	ability to relay crew members' concerns to rig manager
4.01.10	ability to take disciplinary actions

Sub-task
4.02 **Orients new crew members to rig.**

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	ND	NV	ND	ND	ND	ND	yes	yes	yes	NV	ND	ND

Supporting Knowledge & Abilities

4.02.01	knowledge of orientation checklists
4.02.02	ability to assess crew members' abilities such as mechanical aptitude and physical abilities
4.02.03	ability to introduce new crew member to other crew members
4.02.04	ability to explain rig-specific tasks
4.02.05	ability to explain the duties of each job such as derrickhands, motorhands, floorhands and leasehands
4.02.06	ability to explain the expectations for new crew members
4.02.07	ability to ensure crew member understands and retains information
4.02.08	ability to assess performance of new crew members
4.02.09	ability to explain company policies such as drug and alcohol use and disciplinary actions

Sub-task
4.03 **Trains crew members.**

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	ND	NV	ND	ND	ND	ND	yes	yes	yes	NV	ND	ND

Supporting Knowledge & Abilities

4.03.01	knowledge of types of training such as new task, safety procedures and well control
4.03.02	knowledge of training methods such as verbal, visual and hands-on demonstration
4.03.03	knowledge of company policies regarding training of crew members
4.03.04	knowledge of types of safety procedures requiring training such as lockouts, confined space and fall arrest
4.03.05	knowledge of well control training such as duties and positions, and identifying warning signs

4.03.06	ability to conduct safety drills such as blowout preventer (BOP) drills, fire drills, emergency response drills and man-down drills
4.03.07	ability to use training materials such as JSA and job procedure manuals
4.03.08	ability to conduct training at different locations
4.03.09	ability to share personal experiences to enhance training

Trends

Due to the hazards associated with transporting rigs, there is an increase in the requirement for safety meetings and JSAs. Companies are requiring more frequent meetings in order to promote a higher awareness of safety.

The hazards and liability issues have promoted a clearer division of responsibilities between rig technicians and third-party contractors.

Some newer rigs are becoming more complex, which may increase the difficulty of the move.

Related Components

All components apply.

Tools and Equipment

Hand tools, mobile equipment, rigging equipment, PPE and safety equipment, access equipment (ladders).

Task 5 Disassembles rig.

Context

Rig technicians dismantle the rig so that it can be loaded on trucks to move it to another drill site, to a repair shop or to a storage area.

Sub-task 5.01 Removes components.

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	ND	NV	ND	ND	ND	ND	yes	yes	yes	NV	ND	ND

Supporting Knowledge & Abilities

5.01.01	knowledge of rig components such as buildings, drawworks and derrick
5.01.02	knowledge of rental equipment such as centrifuges, surface tanks and flare tanks
5.01.03	knowledge of tubulars such as pipe, drill collars and heavyweight drillpipe
5.01.04	knowledge of types of equipment required for specific jobs such as cranes, trucks and loaders

5.01.05	knowledge of company policies and safety meeting requirements
5.01.06	knowledge of removal procedures and sequences
5.01.07	ability to select and use tools and equipment to remove components
5.01.08	ability to disassemble components
5.01.09	ability to coordinate and work with third-party contractors
5.01.10	ability to identify hazards associated with removing components
5.01.11	ability to follow disassembly procedures and sequences

Sub-task 5.02 **Cleans site.**

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	ND	NV	ND	ND	ND	ND	yes	yes	yes	NV	ND	ND

Supporting Knowledge & Abilities

5.02.01	knowledge of environmental and jurisdictional regulations and policies such as fencing and/or filling ditches, rathole and mousehole
5.02.02	knowledge of company policies regarding site clean-up
5.02.03	ability to remove accumulated refuse

Task 6 Assembles rig.

Context Once the rig components arrive at the drilling site, the rig needs to be assembled in order to commence drilling operations.

Sub-task 6.01 **Prepares site for rig up.**

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	ND	NV	ND	ND	ND	ND	yes	yes	yes	NV	ND	ND

Supporting Knowledge & Abilities

6.01.01	knowledge of terrain
6.01.02	knowledge of site hazards such as overhead power lines and open pits

6.01.03	knowledge of access requirements
6.01.04	ability to lay ground cover such as plastic and/or liner
6.01.05	ability to lay out rig matting
6.01.06	ability to adapt drilling rig setup according to the site such as spotting the first mat over the existing rathole and mousehole, and aligning it with the conductor pipe

---

Sub-task
6.02 **Assembles sub, derrick and drawworks.**

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	ND	NV	ND	ND	ND	ND	yes	yes	yes	NV	ND	ND

Supporting Knowledge & Abilities

6.02.01	knowledge of company policies and safety meeting requirements
6.02.02	knowledge of types of equipment required for assembly such as cranes, trucks and loaders
6.02.03	ability to select and use tools and equipment such as hand tools and manual rigging equipment
6.02.04	ability to identify hazards associated with assembling components
6.02.05	ability to follow assembly procedures and sequences
6.02.06	ability to coordinate and work with third-party contractors
6.02.07	ability to recognize lifting points

Sub-task
6.03 **Spots buildings and equipment.**

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	ND	NV	ND	ND	ND	ND	yes	yes	yes	NV	ND	ND

Supporting Knowledge & Abilities

6.03.01	knowledge of types of buildings and equipment
6.03.02	knowledge of assembly procedures and sequences
6.03.03	knowledge of types of equipment required for specific jobs such as cranes, trucks and loaders
6.03.04	knowledge of company policies and safety meeting requirements

6.03.05	ability to select and use tools and equipment
6.03.06	ability to locate buildings and equipment according to established measurements
6.03.07	ability to recognize lifting points
6.03.08	ability to coordinate and work with third-party contractors
6.03.09	ability to identify hazards associated with placing the equipment

BLOCK C — RIG UP

Trends

Rigging up is becoming less complicated, with new technologies making tasks easier to do. It is less time consuming and requires less physical effort than ever before. However, rig technicians need to adapt to new technologies as they become available.

Due to the dangers associated with new drilling fluids containing hazardous chemicals, there is increased awareness of safety standards, leading to better practices when mixing.

Related Components

All components apply.

Tools and Equipment

See Appendix A.

Task 7 — Performs rig up procedures.

Context

Rig technicians perform rig up procedures to provide the rig with the capability to raise the derrick and operate the drilling equipment. For the purpose of this NOA, rigging in the derrick is included in raising the derrick.

Sub-task 7.01 — Runs air, fuel and hydraulic lines, and power cables.

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	ND	NV	ND	ND	ND	ND	yes	yes	yes	NV	ND	ND

Supporting Knowledge & Abilities

7.01.01	knowledge of types of power cables such as 220 volt, 480 volt and 600 volt
7.01.02	knowledge of the sizes of air, fuel and hydraulic lines
7.01.03	knowledge of the sequence for hooking up air, fuel and hydraulic lines, and power cables
7.01.04	knowledge of the routing of air, fuel and hydraulic lines, and power cables

7.01.05	knowledge of jurisdictional regulations regarding power cables
7.01.06	knowledge of training and certification requirements regarding handling and repairing power cables
7.01.07	knowledge of hazards associated with working with power cables and pressurized lines
7.01.08	ability to locate breakers and ensure they are turned off prior to connecting power cables
7.01.09	ability to hook up air, fuel and hydraulic lines, and power cables according to priority
7.01.10	ability to recognize differences between air, fuel and hydraulic lines
7.01.11	ability to recognize live and de-energized power cables
7.01.12	ability to recognize worn, damaged or defective air, fuel and hydraulic lines, and power cables
7.01.13	ability to repair air, fuel and hydraulic lines

Sub-task

7.02 **Starts and warms up equipment.**

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	ND	NV	ND	ND	ND	ND	yes	yes	yes	NV	ND	ND

Supporting Knowledge & Abilities

7.02.01	knowledge of start-up procedures
7.02.02	knowledge of sequence of start-up
7.02.03	knowledge of auxiliary equipment required for start-up such as fans and block heaters
7.02.04	ability to check fluid levels such as oil and antifreeze
7.02.05	ability to verify that auxiliary equipment such as cooling fans, oil pumps and lubricator pumps are turned on prior to starting up main equipment
7.02.06	ability to verify that drive systems are disengaged
7.02.07	ability to start auxiliary and main equipment
7.02.08	ability to recognize problems associated with start-up such as low oil and fuel pressures

Sub-task
7.03 Raises derrick.

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	ND	NV	ND	ND	ND	ND	yes	yes	yes	NV	ND	ND

Supporting Knowledge & Abilities

7.03.01	knowledge of types of derricks such as singles, doubles and triples
7.03.02	knowledge of derrick components such as lines and overhead equipment
7.03.03	knowledge of derrick raising sequences and procedures according to drilling rig
7.03.04	knowledge of lockout procedures
7.03.05	ability to select and use tools and equipment such as fall arrest equipment and tie off points
7.03.06	ability to route lines to rig in derrick
7.03.07	ability to visually inspect derrick prior to raising
7.03.08	ability to recognize, repair and replace worn, damaged or defective equipment

Sub-task
7.04 Rigs up rig floor and related equipment.

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	ND	NV	ND	ND	ND	ND	yes	yes	yes	NV	ND	ND

Supporting Knowledge & Abilities

7.04.01	knowledge of rig floor components needed to be rigged up such as tongs, slips and pipe handlers
7.04.02	knowledge of sequence and procedures for rigging up rig floor according to drilling rig
7.04.03	knowledge of lockout procedures
7.04.04	ability to use hand signals
7.04.05	ability to select and use tools and equipment such as winches and tag line
7.04.06	ability to visually inspect components and equipment
7.04.07	ability to recognize, repair and replace worn, damaged or defective equipment

Sub-task

7.05 **Installs pre-fabs.**

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	ND	NV	ND	ND	ND	ND	yes	yes	yes	NV	ND	ND

Supporting Knowledge & Abilities

7.05.01	knowledge of types of pre-fabs such as steel and tarp
7.05.02	knowledge of the sequence for setting up pre-fabs
7.05.03	ability to use hand signals
7.05.04	ability to select and use tools and equipment such as winches, hammers and fall arrest equipment
7.05.05	ability to secure pre-fabs

Sub-task

7.06 **Rigs up mud tanks, pumps and circulation system.**

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	ND	NV	ND	ND	ND	ND	yes	yes	yes	NV	ND	ND

Supporting Knowledge & Abilities

7.06.01	knowledge of types and ratings of pumps such as duplex, triplex and submersible
7.06.02	knowledge of mud tank components such as shakers, agitators and lines
7.06.03	knowledge of pump components such as fluid end, power end and pulsation dampeners
7.06.04	knowledge of circulation system components such as lines, valves and hoses
7.06.05	knowledge of pressure ratings of unions and hoses
7.06.06	knowledge of types and ratings of pop valves and pins
7.06.07	knowledge of safety cable requirements on high pressure lines
7.06.08	ability to recognize types of tanks such as mud tanks, shaker tanks, settling tanks, pre mix tanks, suction tanks and pill tanks
7.06.09	ability to select and use tools and equipment
7.06.10	ability to rig up tanks, pumps and circulation systems according to established procedures and sequences
7.06.11	ability to read pressure ratings

7.06.12	ability to recognize and replace pop valve pins according to application
7.06.13	ability to recognize, repair and replace worn, damaged or defective lines, valves and hoses
7.06.14	ability to secure equipment

Sub-task
7.07 **Installs conductor and flow lines to shakers.**

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	ND	NV	ND	ND	ND	ND	yes	yes	yes	NV	ND	ND

Supporting Knowledge & Abilities

7.07.01	knowledge of types of conductors such as air bag and weld-on
7.07.02	knowledge of types of flow lines such as steel and polyvinyl chloride (PVC)
7.07.03	knowledge of fasteners such as straps, turnbuckles and chains
7.07.04	knowledge of hand signals
7.07.05	ability to select and use tools and equipment such as winches, hammers and pry bars
7.07.06	ability to follow installation sequences and procedures according to application
7.07.07	ability to recognize, repair and replace worn, damaged and defective components
7.07.08	ability to ground plastic flow lines and centrifuge lines when using oil-based drilling fluids

---

Sub-task
7.08 **Sets up boiler and steam circulating system.**

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	ND	NV	ND	ND	ND	ND	yes	yes	yes	NV	ND	ND

Supporting Knowledge & Abilities

7.08.01	knowledge of types of boilers
7.08.02	knowledge of boiler components such as burners, relief valves, flue retarders, fuel/water pumps and mercury switches
7.08.03	knowledge of boiler start-up sequence

7.08.04	knowledge of steam circulating system
7.08.05	knowledge of training and certification required to work with boilers
7.08.06	knowledge of components of boilers and steam systems such as lines, safety devices and pop valves
7.08.07	knowledge of hazards associated with working with boilers and steam systems such as superheated high pressure steam and chemicals
7.08.08	ability to inspect boiler and steam circulating system
7.08.09	ability to recognize problems associated with boiler start-up such as over fueling and improper air flow
7.08.10	ability to fire up boiler
7.08.11	ability to select and use tools and equipment
7.08.12	ability to monitor and adjust pH levels at start-up and during operation
7.08.13	ability to secure and fence off blowdown line

Task 8 Prepares for drilling operations.

Context The verification and testing of equipment and their components, and the mixing of drilling fluids are activities that, once completed, allow rig technicians to commence drilling operations. Mouseholes and ratholes are drilled as part of the preparation for drilling operations.

Sub-task 8.01 Checks condition of drilling components.

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	ND	NV	ND	ND	ND	ND	yes	yes	yes	NV	ND	ND

Supporting Knowledge & Abilities

8.01.01	knowledge of equipment that requires assessment prior to commencing drilling operations such as circulating equipment, motor kills, crown saver and emergency shut-downs
8.01.02	knowledge of normal operating parameters of equipment
8.01.03	ability to use lockouts
8.01.04	ability to function test equipment
8.01.05	ability to verify functionality of equipment such as circulating equipment and shakers, hoisting equipment and rotary table

8.01.06	ability to reset and adjust equipment as required
8.01.07	ability to select and use tools and equipment
8.01.08	ability to recognize, repair and replace worn, damaged and defective equipment

---

Sub-task
8.02 **Mixes drilling fluid.**

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	ND	NV	ND	ND	ND	ND	yes	yes	yes	NV	ND	ND

Supporting Knowledge & Abilities

8.02.01	knowledge of the application of drilling fluids such as main hole and surface hole
8.02.02	knowledge of types of drilling fluids such as water-based and oil-based
8.02.03	knowledge of the mixing system and components
8.02.04	knowledge of WHMIS labels and MSDS
8.02.05	knowledge of the dangers of working with hazardous chemicals associated with drilling fluids
8.02.06	ability to select and use tools and equipment such as mud scales, funnels and viscosity cups
8.02.07	ability to perform mathematical calculations such as circulation time, volumes and mixing ratios
8.02.08	ability to follow the mud program or directions provided by the operator's representative
8.02.09	ability to mix different types of drilling fluids according to their application
8.02.10	ability to visually recognize problems with drilling fluids

---

Sub-task
8.03 **Drills mousehole and rathole.**

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	ND	NV	ND	ND	ND	ND	yes	yes	yes	NV	ND	ND

Supporting Knowledge & Abilities

8.03.01	knowledge of BHA required for drilling mousehole and rathole

8.03.02	knowledge of hazards associated with drilling mousehole and rathole
8.03.03	knowledge of drilling sequence for mousehole and rathole
8.03.04	ability to select and use tools and equipment
8.03.05	ability to assemble and disassemble BHA components such as collars, bits and cross-overs
8.03.06	ability to operate equipment such as kelly spinner, tongs and pumps

BLOCK D RIG INSPECTION AND MAINTENANCE

Trends

The responsibility for inspection to improve job safety has become shared with the entire crew.

Related Components (include, but not limited to)

Mechanical systems: engines, drawworks, transmissions, cotter box, swivel, rotary tables, gears, brake linkages, drive shafts, U-joints, brake bands.

Hydraulic systems: BOP, kelly spinner, top drive, cat heads, winches, pipe spinners, catwalks, iron roughnecks.

Pneumatic systems: air compressor, air controls, clutches.

Electrical systems: electrical top drives, breaker panels, silicone control rectifiers (SCR), motor control centers (MCC), generators, electrical motors.

Boilers: burners, relief valves, flue retarders, fuel/water pumps, filters, mercury switches.

Overhead equipment: blocks, winches, hooks, swivels, monkeyboards, top drives, elevators, safety cables, emergency escape devices, traveling equipment.

Floor equipment: slips, tongs, stabbing valves, inside BOP, spinners, dog collars.

Water circulating systems: pumps, unions, hoses, valves, manifolds, hardlines.

Fuel circulating systems: pumps, filters, unions, hoses, valves.

Steam circulating systems: unions, hoses, manifolds, hardlines.

Drilling fluid circulating systems: mud pumps, pulsation dampeners, high pressure hoses and valves, unions, manifolds, washpipe packing, gauges.

Tools and Equipment

See Appendix A.

Task 9 Inspects rig equipment.

Context The inspection of rig equipment is crucial in preventing catastrophic failure, injury and downtime. It is important for rig technicians to pass on knowledge to less experienced hands by including them in the inspection process.

Sub-task 9.01 Performs daily walk-around inspection.

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	ND	NV	ND	ND	ND	ND	yes	yes	yes	NV	ND	ND

Supporting Knowledge & Abilities

9.01.01	knowledge of major and minor deficiencies
9.01.02	knowledge of jurisdictional regulations
9.01.03	knowledge of requirements for posting deficiencies
9.01.04	knowledge of daily operations
9.01.05	knowledge of engine requirements and settings
9.01.06	knowledge of lubrication requirements
9.01.07	knowledge of equipment configuration
9.01.08	ability to establish an inspection routine
9.01.09	ability to recognize hazards such as spills and poor housekeeping
9.01.10	ability to recognize problems such as pending equipment failure, damaged slings and cracked hand railings
9.01.11	ability to recognize deficiencies such as incorrect manifold configuration, improper accumulator configuration and well control equipment out of place
9.01.12	ability to perform sensory inspections such as visual, hearing and smelling

Sub-task 9.02 Performs detailed rig inspection.

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	ND	NV	ND	ND	ND	ND	yes	yes	yes	NV	ND	ND

Supporting Knowledge & Abilities

9.02.01	knowledge of required forms such as company-specific inspection reports, Canadian Association of Oilwell Drilling Contractors (CAODC) checklists, and pre-spud and pre-drillout checklists
9.02.02	knowledge of rules and regulations
9.02.03	knowledge of required inspection frequencies
9.02.04	knowledge of daily operations and proper functioning of equipment
9.02.05	knowledge of accumulator requirements
9.02.06	ability to demonstrate inspection to less experienced hands
9.02.07	ability to document inspection findings
9.02.08	ability to perform sensory inspection
9.02.09	ability to recognize deficiencies

Sub-task
9.03 **Determines required repairs.**

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	ND	NV	ND	ND	ND	ND	yes	yes	yes	NV	ND	ND

Supporting Knowledge & Abilities

9.03.01	knowledge of daily operations and proper functioning of equipment
9.03.02	knowledge of repair history of equipment
9.03.03	knowledge of inspection dates and hours in service
9.03.04	knowledge of tools and equipment used to detect required repairs
9.03.05	ability to recognize problems such as pending equipment failure, damaged slings and cracked hand railings
9.03.06	ability to train others in recognizing and reporting required repairs
9.03.07	ability to use lockouts
9.03.08	ability to prioritize repairs
9.03.09	ability to adapt work around repairs needed
9.03.10	ability to consult with manuals, supervisors and other resources
9.03.11	ability to problem-solve to isolate failure

Task 10 Maintains rig equipment.

Context Maintaining rig equipment is done to prevent equipment damage, to prevent injury and reduce downtime. To make the most efficient use of the crew's time, maintenance can be done during drilling, tripping and logging operations, and on rig moves.

Sub-task 10.01 Maintains mechanical systems.

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	ND	NV	ND	ND	ND	ND	yes	yes	yes	NV	ND	ND

Supporting Knowledge & Abilities

10.01.01	knowledge of mechanical system components such as engines, drawworks, rotary tables, gears, brake linkages, drive shafts, U-joints and brake bands
10.01.02	knowledge of engine requirements such as oil volumes, coolant ratios and air filter indicators
10.01.03	knowledge of lubrication and greasing requirements and components
10.01.04	knowledge of required belts, chains and tensions
10.01.05	knowledge of oil spinners and samples
10.01.06	ability to change oil on mechanical equipment on the rig
10.01.07	ability to operate engines
10.01.08	ability to lock out equipment
10.01.09	ability to make minor repairs to equipment
10.01.10	ability to select and use tools for maintenance

Sub-task 10.02 Maintains hydraulic systems.

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	ND	NV	ND	ND	ND	ND	yes	yes	yes	NV	ND	ND

Supporting Knowledge & Abilities

10.02.01	knowledge of hydraulic system components such as kelly spinner, top drive, cat heads, winches, pipe spinners, catwalks and iron roughnecks

10.02.02	knowledge of hydraulic system for BOPs and accumulator
10.02.03	knowledge of hydraulic filter requirements
10.02.04	knowledge of oil type and reservoir levels
10.02.05	knowledge of normal operating pressures, temperatures and circulation
10.02.06	knowledge of accumulator pressures and pre-charge pressures
10.02.07	knowledge of pressure ratings for hydraulic pipe and fittings
10.02.08	ability to find and repair leaks in hoses and fittings
10.02.09	ability to remove and replace components
10.02.10	ability to change filters and oil
10.02.11	ability to check accumulator suction screens
10.02.12	ability to adjust packing on charge pumps
10.02.13	ability to check and adjust pre-charge pressures

Sub-task
10.03 **Maintains pneumatic systems.**

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	ND	NV	ND	ND	ND	ND	yes	yes	yes	NV	ND	ND

Supporting Knowledge & Abilities

10.03.01	knowledge of pneumatic system components such as air compressors, clutches, controls, pumps and horns
10.03.02	knowledge of air-over-hydraulic systems
10.03.03	knowledge of system pressures
10.03.04	knowledge of pressure ratings
10.03.05	ability to lock out pneumatic equipment
10.03.06	ability to add additives such as methanol, air brake antifreeze and air dryer pellets
10.03.07	ability to blow down air systems
10.03.08	ability to check and change oil in air compressors
10.03.09	ability to recognize and repair leaks

Sub-task
10.04 **Maintains electrical systems.**

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	ND	NV	ND	ND	ND	ND	yes	yes	yes	NV	ND	ND

Supporting Knowledge & Abilities

10.04.01	knowledge of electrical system components such as electrical top drives, breaker panels, SCR, MCC, generators and electrical motors
10.04.02	knowledge of training and certification requirements for working on electrical systems
10.04.03	knowledge of amperage and voltage
10.04.04	knowledge of electrical testing equipment
10.04.05	knowledge of types of plug ends
10.04.06	knowledge of phase specifications such as single and three phase
10.04.07	ability to lock out electrical systems
10.04.08	ability to record wire configurations
10.04.09	ability to lubricate electrical motors
10.04.10	ability to isolate electrical faults
10.04.11	ability to repair damaged cords by changing cord ends, heat shrinking insulation and applying insulating tape
10.04.12	ability to synchronize gen-sets in SCR

Sub-task
10.05 **Maintains boiler.**

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	ND	NV	ND	ND	ND	ND	yes	yes	yes	NV	ND	ND

Supporting Knowledge & Abilities

10.05.01	knowledge of types of boilers
10.05.02	knowledge of boiler components such as burners, relief valves, flue retarders, fuel/water pumps and mercury switches
10.05.03	knowledge of additives
10.05.04	knowledge of training and certification required to work with boilers
10.05.05	knowledge of cleaning requirements

10.05.06	knowledge of required cool-down procedures
10.05.07	ability to lock out boiler
10.05.08	ability to blow down boiler
10.05.09	ability to check pH and stack temperature
10.05.10	ability to change boiler components such as jets and igniter plugs
10.05.11	ability to complete boiler maintenance documentation
10.05.12	ability to change filters
10.05.13	ability to add chemicals and bypass chemical pot
10.05.14	ability to clean boiler and boiler components
10.05.15	ability to fire up boiler
10.05.16	ability to recognize, remove and replace worn, damaged and defective hoses, valves and pumps

---

Sub-task
10.06 **Maintains overhead equipment.**

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	ND	NV	ND	ND	ND	ND	yes	yes	yes	NV	ND	ND

Supporting Knowledge & Abilities

10.06.01	knowledge of overhead equipment such as blocks, winches and top drives
10.06.02	knowledge of wear points
10.06.03	knowledge of location of grease nipples and lubrication points
10.06.04	ability to follow lockout procedures
10.06.05	ability to lubricate all overhead equipment to OEM specifications
10.06.06	ability to check oil levels in top drive, swivels and kelly spinner
10.06.07	ability to operate and adjust overhead equipment
10.06.08	ability to check safety cables for wear

Sub-task
10.07 **Maintains floor equipment.**

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	ND	NV	ND	ND	ND	ND	yes	yes	yes	NV	ND	ND

Supporting Knowledge & Abilities

10.07.01	knowledge of floor equipment such as slips, tongs, stabbing valves, inside BOP, spinners and dog collars
10.07.02	knowledge of equipment certification requirements
10.07.03	knowledge of sizing of dies for slips
10.07.04	knowledge of housekeeping requirements
10.07.05	knowledge of equipment storage requirements
10.07.06	ability to lubricate floor equipment
10.07.07	ability to change make-up and break-out lines
10.07.08	ability to change tong dies and slip dies
10.07.09	ability to change pipe spinner chain

Sub-task
10.08 **Maintains drilling fluid circulating systems.**

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	ND	NV	ND	ND	ND	ND	yes	yes	yes	NV	ND	ND

Supporting Knowledge & Abilities

10.08.01	knowledge of drilling fluid circulating systems
10.08.02	knowledge of hammer unions and pressure ratings
10.08.03	knowledge of mud pumps
10.08.04	knowledge of safety cable requirements
10.08.05	knowledge of pressure ratings on circulating equipment such as kelly hose, shock hose and pumps
10.08.06	ability to follow lockout procedures
10.08.07	ability to change low pressure valves
10.08.08	ability to change or rebuild high pressure valves
10.08.09	ability to repair leaks
10.08.10	ability to service mud pumps such as power end and fluid end
10.08.11	ability to adjust tension on belts and chains
10.08.12	ability to set pop valve
10.08.13	ability to isolate pump using high pressure valves
10.08.14	ability to change packing for pumps such as trip pump and pre-charge pump
10.08.15	ability to identify gasket requirements for mudline unions

10.08.16	ability to change gauges and sensors
10.08.17	ability to winterize circulating systems using methods such as blowing out with air and adding antifreeze
10.08.18	ability to lubricate components such as washpipe and high pressure valves
10.08.19	ability to change washpipe packing

Sub-task
10.09 **Maintains water, steam and fuel circulating systems.**

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	ND	NV	ND	ND	ND	ND	yes	yes	yes	NV	ND	ND

Supporting Knowledge & Abilities

10.09.01	knowledge of water, steam and fuel circulating systems
10.09.02	knowledge of hammer unions and pressure ratings
10.09.03	knowledge of water and fuel pumps
10.09.04	ability to follow lockout procedures
10.09.05	ability to adjust steam and water returns
10.09.06	ability to service steam heaters
10.09.07	ability to change low pressure valves
10.09.08	ability to recognize types of valves
10.09.09	ability to repair leaks
10.09.10	ability to build hoses for repairs
10.09.11	ability to manipulate water and steam manifold
10.09.12	ability to change packing on pumps such as water and fuel pumps
10.09.13	ability to change gauges
10.09.14	ability to service and operate wash guns
10.09.15	ability to change fuel filters
10.09.16	ability to winterize circulating systems using methods such as blowing out with air and adding antifreeze
10.09.17	ability to lubricate components

Trends

In some locations, surface hole drilling is performed by pre-set rigs in advance of the drilling rig moving on to the location.

There are always new technologies being introduced to make drilling operations safer and more efficient.

Wire line surveys continue to be used and the use of specialized surveying equipment is increasing.

New casing running technologies are being developed and are being tested.

Related Components (include, but not limited to)

Bottom hole assembly (BHA): drill bit, collars, floats, TOTCO™ rings, crossover subs, mud motors, stabilizers, jars, shock subs, monels, heavyweight drillpipe.

Blowout preventer (BOP): accumulator, hydraulic-controlled relief (HCR) valves, kill line valve, annular, pipe rams, blind rams, shear rams.

Associated BOP components: degasser, degasser lines, manifold, flare lines, chokes, valves, choke hose, kill line hose.

Drilling fluids: water-based and oil-based drilling fluids, additives.

Drilling components: floor equipment, drilling console, mud pumps, drawworks, top drive, swivel, shakers, shale bin.

Tripping components: tubulars, elevators, mud can/kelly can, stabbing valve, slips, tongs, dog collar, blocks, birdbath, monkeyboard, crown saver, deadman, fastline anchor clamps, controls.

Casing components: casing, protectors, float collars, float shoes, shoe collars, marker joints, stop collars, scratchers, centralizers.

Tools and Equipment

See Appendix A.

Task 11 Prepares drill string.

Context

The drill string consists of the bottom hole assembly (BHA) which includes a bit, collars, crossovers (adapters), and, if required, specialized drilling tools such as mud motors, jars, reamers and shock subs. The BHA is suspended from lengths of drill pipe. The assembly of drill pipe and BHA is called the drill string. The drill string is lengthened by adding sections of pipe, or by uncoiling a continuous length of pipe from a coil (coiled tubing rig). The drill string is used for drilling the surface hole or main hole.

Sub-task 11.01 **Makes up bottom hole assembly (BHA).**

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	ND	NV	ND	ND	ND	ND	yes	yes	yes	NV	ND	ND

Supporting Knowledge & Abilities

11.01.01	knowledge of BHA components such as drill bit, collars, floats, TOTCO™ rings and crossover subs
11.01.02	knowledge of thread types and torque specifications
11.01.03	knowledge of bit sizes and bit breaker sizes
11.01.04	ability to measure outside diameter (OD) and inside diameter (ID) using calipers
11.01.05	ability to size and change drill bit nozzles
11.01.06	ability to select and use tools and equipment
11.01.07	ability to calculate torques
11.01.08	ability to assemble BHA
11.01.09	ability to select and use tool joint compound
11.01.10	ability to measure BHA length to start pipe tally
11.01.11	ability to record measurements and serial numbers from BHA components
11.01.12	ability to use winches to pick up tools

Sub-task
11.02 **Picks up and lays down collars.**

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	ND	NV	ND	ND	ND	ND	yes	yes	yes	NV	ND	ND

Supporting Knowledge & Abilities

11.02.01	knowledge of sizes of collars
11.02.02	knowledge of thread types and torque specifications
11.02.03	knowledge of elevator sizing
11.02.04	knowledge of safe handling of drill collars on floor and catwalk
11.02.05	ability to hoist and lower collars with equipment such as winches, collar slings, loaders and manual rigging equipment
11.02.06	ability to ensure lifting nubbins, pickup subs and protectors are tight
11.02.07	ability to latch on to collar with elevator (for top drive)
11.02.08	ability to refer to pipe tally information such as OD and ID
11.02.09	ability to use hand signals

Sub-task
11.03 **Monitors surface hole conditions while drilling.**

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	ND	NV	ND	ND	ND	ND	yes	yes	yes	NV	ND	ND

Supporting Knowledge & Abilities

11.03.01	knowledge of geological formations
11.03.02	knowledge of offset wells
11.03.03	knowledge of oil company parameters
11.03.04	knowledge of swabbing and surging
11.03.05	ability to prevent mud rings
11.03.06	ability to deal with mud rings at surface
11.03.07	ability to monitor tank and hole volumes
11.03.08	ability to interpret hole condition indicators such as penetration rate, cuttings, fluid returns, torque, drag and pump pressure
11.03.09	ability to use gas detector
11.03.10	ability to set alarms for flow and tank volumes

Task 12 Installs blowout preventer (BOP).

Context BOPs are used to control kicks and prevent blowouts. A thorough understanding of the function, operation, maintenance and testing of the BOP is an essential part of crew training and vital in the event of a kick situation. By law, BOPs must be used in drilling operations and tested regularly.

Sub-task 12.01 Prepares for BOP installation.

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	ND	NV	ND	ND	ND	ND	yes	yes	yes	NV	ND	ND

Supporting Knowledge & Abilities

12.01.01	knowledge of work permits such as hot, cold and confined space
12.01.02	knowledge of cellar preparation
12.01.03	ability to measure out casing bowl height for positioning BOP
12.01.04	ability to organize tools for the job
12.01.05	ability to lay down cutoff casing and conductor
12.01.06	ability to install casing bowl onto casing using rigging equipment
12.01.07	ability to remove fluid from casing

Sub-task 12.02 Assembles BOP equipment and associated components.

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	ND	NV	ND	ND	ND	ND	yes	yes	yes	NV	ND	ND

Supporting Knowledge & Abilities

12.02.01	knowledge of BOP components such as accumulator, HCR valves, kill line, annular, pipe rams, blind rams and shear rams
12.02.02	knowledge of associated components such as degasser, degasser lines, manifold, flare lines, chokes and valves
12.02.03	knowledge of safe BOP lifting procedures

12.02.04	knowledge of component requirements such as types of ring gaskets, stud tensile ratings, torques and tightening sequences
12.02.05	knowledge of National Association of Corrosion Engineers (NACE) stamped equipment
12.02.06	knowledge of types and sizes of flare lines
12.02.07	knowledge of components of manifold such as chokes, hoses and valves
12.02.08	knowledge of procedure for hooking up accumulator hoses
12.02.09	ability to rig up manifold
12.02.10	ability to rig in flow nipple, flow line, catch tray and hole fill hose
12.02.11	ability to manipulate related BOP equipment with winches

---

Sub-task 12.03 **Pressurizes BOP accumulator.**

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	ND	NV	ND	ND	ND	ND	yes	yes	yes	NV	ND	ND

Supporting Knowledge & Abilities

12.03.01	knowledge of accumulator pressures, pre-charges, operating range and pressure ratings
12.03.02	knowledge of BOP remote and manual controls
12.03.03	knowledge of nitrogen and air pump backup requirements
12.03.04	ability to fire up accumulator
12.03.05	ability to function test BOP
12.03.06	ability to troubleshoot accumulator malfunctions such as incorrect hose hookup, and faulty programmable logic controller (PLC) and air remotes
12.03.07	ability to check accumulator fluid levels

Sub-task 12.04 **Pressure tests BOP.**

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	ND	NV	ND	ND	ND	ND	yes	yes	yes	NV	ND	ND

Supporting Knowledge & Abilities

12.04.01	knowledge of pressure testing procedures
12.04.02	knowledge of high/low limits and time to hold tests
12.04.03	knowledge of equipment that needs to be pressure tested such as upper and lower kelly cocks, stabbing valves, inside BOP, manifold valves and BOP stack
12.04.04	knowledge of accumulator function tests and requirements
12.04.05	ability to set up test plug/cup
12.04.06	ability to find and fix leaks
12.04.07	ability to operate mud pump
12.04.08	ability to record results of tests
12.04.09	ability to verify BOP and manifold configuration before drill out
12.04.10	ability to winterize manifold by blowing out and/or filling with antifreeze

Task 13 Performs drilling activities.

Context Drilling activities are done in the search for oil and gas. This task covers those drilling activities performed after a surface hole has been drilled. Drilling fluids are constantly pumped through the drill string in order to cool the drill bit, clean the annulus and maintain the condition of the hole. Rig technicians must closely monitor all aspects of drilling.

Sub-task 13.01 **Maintains drilling fluids.**

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	ND	NV	ND	ND	ND	ND	yes	yes	yes	NV	ND	ND

Supporting Knowledge & Abilities

13.01.01	knowledge of types of drilling fluids such as water-based and oil-based
13.01.02	knowledge of drilling fluid additives and their purposes
13.01.03	knowledge of mud tanks and circulating systems
13.01.04	knowledge of geological formations

13.01.05	ability to monitor drilling fluid properties such as pH, weight, viscosity and fluid loss
13.01.06	ability to follow procedures for handling and mixing additives such as caustic soda and lime
13.01.07	ability to read mud reports and follow recommendations
13.01.08	ability to change shaker screens to suit situation
13.01.09	ability to run centrifuge when required
13.01.10	ability to measure and add water at a fixed rate
13.01.11	ability to transfer fluids from reserve tanks (tank farm)

Sub-task

13.02 **Operates drilling equipment.**

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	ND	NV	ND	ND	ND	ND	yes	yes	yes	NV	ND	ND

Supporting Knowledge & Abilities

13.02.01	knowledge of drilling equipment such as kelly, drilling console, mud pumps, drawworks, top drive, swivel, shakers and shale bin
13.02.02	knowledge of floor equipment and limitations
13.02.03	ability to run drilling console for drilling operations
13.02.04	ability to operate BOP controls
13.02.05	ability to follow company policies and OEM recommendations on equipment operation
13.02.06	ability to adapt to changing conditions

Sub-task

13.03 **Monitors drilling conditions and equipment.**

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	ND	NV	ND	ND	ND	ND	yes	yes	yes	NV	ND	ND

Supporting Knowledge & Abilities

13.03.01	knowledge of tank monitor
13.03.02	knowledge of alarm settings

13.03.03	knowledge of set parameters such as weight on bit, maximum pressure, strokes per minute (spm) and revolutions per minute (rpm)
13.03.04	knowledge of geological formations
13.03.05	knowledge of flow check and shut-in procedures
13.03.06	knowledge of necessary data to be recorded in tour book such as reduced speed pump pressure (RSPP), maximum allowable casing pressure (MACP), torque, rpm and off bottom pressure
13.03.07	knowledge of drilling practices such as drill out procedures and fast drilling
13.03.08	ability to monitor cuttings and fluid returns
13.03.09	ability to recognize changes in wellbore conditions such as drilling in coal seams and sloughing hole
13.03.10	ability to monitor performance of equipment such as mud pumps, drawworks, top drive, swivel and shakers
13.03.11	ability to remove cuttings from shale bin
13.03.12	ability to recognize washes in drill string

Sub-task
13.04 **Maintains pipe tally.**

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	ND	NV	ND	ND	ND	ND	yes	yes	yes	NV	ND	ND

Supporting Knowledge & Abilities

13.04.01	knowledge of pipe grade differences and position in the well
13.04.02	knowledge of pipe specifications such as OD and ID, grades and weights
13.04.03	knowledge of inventory of all tubulars on location
13.04.04	ability to document pipe inventory
13.04.05	ability to keep track of pipe in the hole and downhole tools on paper and on the electronic drilling recorder (EDR)
13.04.06	ability to perform calculations such as BHA calculation, pipe tally and hole depth

---

Sub-task
13.05 **Surveys wellbore.**

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	ND	NV	ND	ND	ND	ND	yes	yes	yes	NV	ND	ND

Supporting Knowledge & Abilities

13.05.01	knowledge of wire line surveys (clock or electronic) and specialized survey equipment
13.05.02	knowledge of survey equipment assembly procedures
13.05.03	knowledge of safe practices for running wire line spool
13.05.04	knowledge of survey intervals
13.05.05	ability to run wire line spool
13.05.06	ability to interpret and record survey information
13.05.07	ability to inform company representative of survey results
13.05.08	ability to retie wire line
13.05.09	ability to assemble survey barrel
13.05.10	ability to cycle pump for specialized survey equipment
13.05.11	ability to recognize line damage
13.05.12	ability to change survey line

Task 14 Performs tripping activities.

Context Tripping — pulling or running in tubulars out of or into the wellbore — is necessary for multiple reasons. These may include the change of the drill bit or BHA, breaking up mud rings, doing wiper trips, and after achieving total depth (TD).

Sub-task 14.01 **Prepares for trip.**

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	ND	NV	ND	ND	ND	ND	yes	yes	yes	NV	ND	ND

Supporting Knowledge & Abilities

14.01.01	knowledge of tripping equipment such as elevators, mud can/kelly can, stabbing valve, slips, tongs, monkeyboard and controls
14.01.02	knowledge of hole conditions
14.01.03	knowledge of torque requirements
14.01.04	knowledge of pipe displacement and capacities

14.01.05	knowledge of tong jaw sizing
14.01.06	knowledge of shut-in procedures while tripping
14.01.07	ability to inspect tripping equipment
14.01.08	ability to set up trip tank to fill hole
14.01.09	ability to blow back kelly or top drive with air in winter
14.01.10	ability to perform required flow checks
14.01.11	ability to complete trip sheets

Sub-task
14.02 **Trips drill string and BHA.**

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	ND	NV	ND	ND	ND	ND	yes	yes	yes	NV	ND	ND

Supporting Knowledge & Abilities

14.02.01	knowledge of tripping equipment such as elevators, mud can/kelly can, stabbing valve, slips, tongs, monkeyboard and controls
14.02.02	knowledge of hole conditions
14.02.03	knowledge of torque requirements
14.02.04	knowledge of tong jaw sizing
14.02.05	knowledge of shut-in procedures while tripping
14.02.06	knowledge of kick warning signs while tripping
14.02.07	knowledge of procedures to rack back tubulars in monkeyboard
14.02.08	ability to change elevators
14.02.09	ability to use winches on the rig floor to manipulate drilling tools such as pickup subs, jars, bits and bit subs
14.02.10	ability to ream in and out of the hole
14.02.11	ability to monitor fluid levels at required flow check intervals
14.02.12	ability to function test crown saver
14.02.13	ability to complete trip sheets
14.02.14	ability to record trip sheet data in tour sheet
14.02.15	ability to use mud can
14.02.16	ability to recognize hazards while tripping
14.02.17	ability to lubricate equipment as needed
14.02.18	ability to prepare for drill string changes while tripping by getting new bit and jars ready, making a new tally and recording serial numbers

14.02.19	ability to strap out and compare to pipe tally
14.02.20	ability to make up and break pipe and collars
14.02.21	ability to circulate kelly in kellysock while tripping

---

Sub-task
14.03 **Performs slip and cut.**

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	ND	NV	ND	ND	ND	ND	yes	yes	yes	NV	ND	ND

Supporting Knowledge & Abilities

14.03.01	knowledge of rig-specific slip and cut procedures
14.03.02	ability to recognize worn or damaged drill line
14.03.03	ability to perform megajoule calculations using required formula
14.03.04	ability to hang blocks
14.03.05	ability to torque deadman and fastline anchor clamps
14.03.06	ability to reset megajoules on EDR and record in tour sheet
14.03.07	ability to reset and function test crown saver
14.03.08	ability to dispose of used drill line

Sub-task
14.04 **Lays down pipe and collars.**

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	ND	NV	ND	ND	ND	ND	yes	yes	yes	NV	ND	ND

Supporting Knowledge & Abilities

14.04.01	knowledge of rig-specific laydown procedures
14.04.02	knowledge of pipe handler / laydown truck rig in procedures and operation
14.04.03	knowledge of sling ratings
14.04.04	knowledge of winch load limits
14.04.05	knowledge of elevator sizing
14.04.06	knowledge of safe handling of drill collars on floor and catwalk
14.04.07	ability to use bumper block
14.04.08	ability to inspect slings prior to use

14.04.09	ability to use pipe tubs
14.04.10	ability to lower collars with equipment such as hydraulic catwalks, winches, loaders and laydown line
14.04.11	ability to ensure lifting nubbins, pickup subs and protectors are tight
14.04.12	ability to break pipe and collars
14.04.13	ability to tier pipe using stripping and chocks

Task 15 Performs casing activities.

Context

Rig technicians are responsible for preparing and running casing strings. Many of the tasks related to casing activities must be performed under time constraints.

Surface casing provides a suitable anchor for the BOP stack and isolates surface groundwater from the wellbore.

Intermediate casing protects against unstable formations such as loss circulation zones and high pressure zones.

Production casing provides the means to transport the hydrocarbons to the surface.

When running casing, rig technicians must work with third-party equipment and contractors.

Sub-task 15.01 Prepares casing.

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	ND	NV	ND	ND	ND	ND	yes	yes	yes	NV	ND	ND

Supporting Knowledge & Abilities

15.01.01	knowledge of sizes and weights of casing
15.01.02	knowledge of hazards of unloading and tiering casing
15.01.03	ability to unload and tier casing
15.01.04	ability to remove protectors
15.01.05	ability to drift casing to check ID
15.01.06	ability to identify defective casing
15.01.07	ability to strap casing, float collars, shoe joints and marker joints

15.01.08	ability to apply thread compound to casing threads
15.01.09	ability to flag casing for marker joints, stop collars and centralizers

---

Sub-task
15.02 **Installs casing equipment.**

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	ND	NV	ND	ND	ND	ND	yes	yes	yes	NV	ND	ND

Supporting Knowledge & Abilities

15.02.01	knowledge of casing equipment such as power tongs, casing fill equipment, elevators and slips
15.02.02	knowledge of hand signals
15.02.03	knowledge of types and sizes of elevators and slips
15.02.04	ability to prepare rig floor and derrick for casing
15.02.05	ability to transport equipment to and from rig floor
15.02.06	ability to rig up power tongs, elevators and casing fill equipment

---

Sub-task
15.03 **Runs casing.**

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	ND	NV	ND	ND	ND	ND	yes	yes	yes	NV	ND	ND

Supporting Knowledge & Abilities

15.03.01	knowledge of torque specifications
15.03.02	knowledge of running procedures such as use of snubbing ropes and thread protectors
15.03.03	knowledge of float shoes and thread types
15.03.04	knowledge of casing accessories such as scratchers, centralizers, and float and shoe collar
15.03.05	knowledge of surging pressures
15.03.06	knowledge of sizes of casing
15.03.07	knowledge of hole conditions
15.03.08	knowledge of when to circulate casing

15.03.09	ability to calculate displacement and capacity
15.03.10	ability to rig in casing running equipment such as elevators, tongs, casing fill equipment and slips
15.03.11	ability to select and use thread compound
15.03.12	ability to inspect third-party equipment and verify certifications
15.03.13	ability to fill casing
15.03.14	ability to torque to specifications
15.03.15	ability to monitor fluid returns
15.03.16	ability to operate drilling console controls
15.03.17	ability to retrieve casing from catwalk
15.03.18	ability to screw casing joints together
15.03.19	ability to work from stabbing board
15.03.20	ability to work with different types and sizes of elevators and slips
15.03.21	ability to rig up circulating equipment
15.03.22	ability to rig up and work with pipe handlers (lay-down machines)
15.03.23	ability to circulate casing
15.03.24	ability to change properties of drilling fluids

Sub-task
15.04 Cements casing.

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	ND	NV	ND	ND	ND	ND	yes	yes	yes	NV	ND	ND

Supporting Knowledge & Abilities

15.04.01	knowledge of cementing equipment such as cement heads, high pressure lines, wiper plugs, chicksan and safety cables
15.04.02	knowledge of cementing procedures
15.04.03	knowledge of cement wait times
15.04.04	knowledge of hazards such as cementing equipment and properties of cement
15.04.05	knowledge of hand signals
15.04.06	ability to transport equipment to and from rig floor using winches
15.04.07	ability to use sugar to prevent returned cement from hardening
15.04.08	ability to inspect third-party equipment and verify certifications
15.04.09	ability to organize vac truck and water truck

15.04.10	ability to flush conductor barrel or BOP with water
15.04.11	ability to rig up cementers
15.04.12	ability to work casing string
15.04.13	ability to chain down casing when plug is dropped
15.04.14	ability to recognize cementing problems such as hydraulicing of casing, loss of returns and plug not holding
15.04.15	ability to recognize changes in mud properties such as water and cement content
15.04.16	ability to install and set casing slips when required

Task 16 Performs specialized drilling operations.

Context

These operations require specialized skills. They all involve third-party contractors.

Coring is done primarily to obtain samples for geological analysis and testing.

Directional drilling curves the well during the drilling process using specialized equipment; it is done to increase production and locate deposits that are not directly beneath the surface location.

Underbalanced / air drilling is done to prevent damage to formations that may occur using conventional drilling fluid.

Sub-task 16.01 Performs coring activities.

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	ND	NV	ND	ND	ND	ND	yes	yes	yes	NV	ND	ND

Supporting Knowledge & Abilities

16.01.01	knowledge of coring procedures
16.01.02	knowledge of types of core barrels
16.01.03	ability to work with third-party contractors
16.01.04	ability to follow third-party contractor parameters and instructions
16.01.05	ability to recover core samples

16.01.06	ability to handle core tools
16.01.07	ability to handle and store core samples

Sub-task
16.02 **Performs directional drilling.**

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	ND	NV	ND	ND	ND	ND	yes	yes	yes	NV	ND	ND

Supporting Knowledge & Abilities

16.02.01	knowledge of directional drilling procedures
16.02.02	knowledge of directional drilling equipment such as measurement while drilling (MWD), mud motors and rotary steerable motors
16.02.03	knowledge of hazards involved with table torque
16.02.04	knowledge of parameters such as maximum differential pressure, maximum rpm, weight on bit (WOB) and pump rate
16.02.05	ability to select pop valve pin setting and sizes of heads and liners
16.02.06	ability to work with third-party contractors and equipment
16.02.07	ability to cycle pumps for surveys
16.02.08	ability to steer mud motor using equipment such as steering cable, table brake and top drive
16.02.09	ability to install sensors on standpipe
16.02.10	ability to read tool faces

Sub-task
16.03 **Performs underbalanced / air drilling.**

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	ND	NV	ND	ND	ND	ND	yes	yes	yes	NV	ND	ND

Supporting Knowledge & Abilities

16.03.01	knowledge of underbalanced / air drilling procedures
16.03.02	knowledge of underbalanced / air drilling equipment such as compressors, rotating heads, float equipment and separator
16.03.03	knowledge of underbalanced / air drilling materials such as air, nitrogen and foam

16.03.04	knowledge of fluid required on surface for underbalanced / air drilling
16.03.05	ability to work with third-party contractors and equipment

Task 17 Performs specialized well operations.

Context

Fishing and stuck pipe operations are important to deal with unexpected complications during drilling operations.

Sour wells, which contain H_2S, must be detected because of the extreme danger associated with this poisonous gas.

Sub-task 17.01 Performs fishing and stuck pipe operations.

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	ND	NV	ND	ND	ND	ND	yes	yes	yes	NV	ND	ND

Supporting Knowledge & Abilities

17.01.01	knowledge of situations such as twist-offs and stuck or tight pipe
17.01.02	knowledge of working tight hole and jarring procedures
17.01.03	knowledge of stuck pipe situations such as differentially stuck, keyseats and formation faults, and sloughing or swelling formations
17.01.04	knowledge of fishing techniques such as free pointing, backing off, performing cut and thread, and spotting acid or oil
17.01.05	knowledge of company policies on fishing operations
17.01.06	ability to communicate problems to tool push and well site supervisor
17.01.07	ability to use fishing tools and equipment such as washover pipe, magnets, spears, grapples, overshots and surface jars
17.01.08	ability to modify actions and adapt to circumstances according to situation
17.01.09	ability to apply jarring procedures
17.01.10	ability to work and communicate with third-party contractors
17.01.11	ability to inspect overhead equipment between jarring operations

Sub-task
17.02 **Performs sour well operations.**

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	ND	NV	ND	ND	ND	ND	yes	yes	yes	NV	ND	ND

Supporting Knowledge & Abilities

17.02.01	knowledge of NACE certification requirements for working in sour gas conditions
17.02.02	knowledge of H_2S
17.02.03	knowledge of shut-in procedures while working with H_2S
17.02.04	knowledge of Emergency Response Plan (ERP)
17.02.05	knowledge of specific equipment requirements such as shear rams, boosters, well ignition equipment, blanking tool, supplied air equipment and self-contained breathing apparatus (SCBA)
17.02.06	knowledge of exposure limits
17.02.07	knowledge of fluid requirements
17.02.08	knowledge of H_2S scrubbing materials
17.02.09	knowledge of drill pipe shearing procedures
17.02.10	ability to monitor for sour gas using equipment such as hand held units and mounted monitoring equipment
17.02.11	ability to work with third-party contractors
17.02.12	ability to perform man-down drills
17.02.13	ability to apply full accumulator pressure to shear rams

Sub-task
17.03 **Performs well control operations.**

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	ND	NV	ND	ND	ND	ND	yes	yes	yes	NV	ND	ND

Supporting Knowledge & Abilities

17.03.01	knowledge of well control methods such as drillers' method, low choke, wait and weight, and volumetric
17.03.02	knowledge of well control equipment such as chokes, manifold, degasser, flare line, BOPs and accumulator
17.03.03	knowledge of stripping and snubbing procedures

17.03.04	knowledge of maximum allowable casing pressure (MACP)
17.03.05	ability to change annular preventer pressure settings
17.03.06	ability to read and record well control data
17.03.07	ability to run choke
17.03.08	ability to mix barite at a fast rate
17.03.09	ability to monitor tank volumes
17.03.10	ability to light flare stack
17.03.11	ability to adapt to changing conditions

Sub-task
17.04 **Rigs wireline loggers in and out.**

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	ND	NV	ND	ND	ND	ND	yes	yes	yes	NV	ND	ND

Supporting Knowledge & Abilities

17.04.01	knowledge of third-party logging equipment
17.04.02	knowledge of hazards associated with radioactive sources
17.04.03	knowledge of restrictive areas while logging
17.04.04	ability to lift wireline equipment to floor using winch
17.04.05	ability to monitor well while logging
17.04.06	ability to lock out elevators in a latched position

Sub-task
17.05 **Handles test tools.**

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	ND	NV	ND	ND	ND	ND	yes	yes	yes	NV	ND	ND

Supporting Knowledge & Abilities

17.05.01	knowledge of drill stem testing (DST) equipment such as downhole safety valves (DSV), packers and methanol injection tools
17.05.02	knowledge of reverse circulating
17.05.03	knowledge of H_2S

17.05.04	knowledge of restrictions while testing
17.05.05	ability to work with and follow instructions from third-party contractors
17.05.06	ability to rig up test line
17.05.07	ability to ignite gas at flare pit or flare stack
17.05.08	ability to select tong jaws
17.05.09	ability to use test plugs
17.05.10	ability to obtain samples

Sub-task
17.06 **Runs packers and bridge plugs.**

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	ND	NV	ND	ND	ND	ND	yes	yes	yes	NV	ND	ND

Supporting Knowledge & Abilities

17.06.01	knowledge of pipe tally in order to place packers and bridge plugs
17.06.02	ability to understand and execute third-party instructions related to running and setting packers and bridge plugs
17.06.03	ability to read weight indicator
17.06.04	ability to pressure test packers and bridge plugs

Sub-task
17.07 **Completes the well for production.**

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	ND	NV	ND	ND	ND	ND	yes	yes	yes	NV	ND	ND

Supporting Knowledge & Abilities

17.07.01	knowledge of perforating equipment
17.07.02	knowledge of wellhead equipment such as rings, valves, studs and hammer wrenches
17.07.03	knowledge of lifting and hoisting techniques
17.07.04	ability to recognize pressure ratings of wellhead equipment such as 2000, 3000 and 5000 psi
17.07.05	ability to use tools and equipment such as packers and tubing tongs
17.07.06	ability to coordinate with third-party contractors to lower perforating gun

17.07.07	ability to run tubing
17.07.08	ability to connect equipment to casing bowl with nuts, studs and ring
17.07.09	ability to recognize incompatible equipment
17.07.10	ability to use hand signals

Sub-task
17.08 **Completes the well for abandonment.**

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	ND	NV	ND	ND	ND	ND	yes	yes	yes	NV	ND	ND

Supporting Knowledge & Abilities

17.08.01	knowledge of cementing equipment such as circulating heads, chicksan and hoses
17.08.02	knowledge of hazards of cement and equipment
17.08.03	knowledge of wireline equipment such as wireline tools, elevator hook and sheaves
17.08.04	knowledge of hazards of running wireline
17.08.05	ability to install and remove cement plug equipment
17.08.06	ability to work with third-party contractors such as cementers, consultants and company representatives
17.08.07	ability to pump drilling fluids to cementers' equipment
17.08.08	ability to trip pipe
17.08.09	ability to circulate drilling fluids to flush pipe
17.08.10	ability to assist wirelines in setting up equipment to feel plug

Trends As technology advances, equipment and working methods are improving the way that rigging out is done. However, there are more environmental issues surrounding the use and disposal of drilling fluids and chemicals used by the drilling rig. Due to cleaning and disposal methods dictated by jurisdictional regulations and guidelines, the complexity and duration of rigging out procedures can increase.

Related Components All components apply.

Tools and Equipment See Appendix A.

Task 18 Performs rig out procedures.

Context Rig technicians dismantle the drilling rig to be able to move it to storage (racking) or relocate it to another drilling site. They perform this procedure in an efficient and safe manner.

Sub-task 18.01 Drains fluids.

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	ND	NV	ND	ND	ND	ND	yes	yes	yes	NV	ND	ND

Supporting Knowledge & Abilities

18.01.01	knowledge of types of fluids such as water and drilling fluids
18.01.02	knowledge of winterizing requirements
18.01.03	knowledge of jurisdictional regulations and operational requirements regarding the disposal of drained fluids
18.01.04	ability to recognize when fluids need to be drained and blown out
18.01.05	ability to select and use tools and equipment

18.01.06	ability to drain and blow out water, steam and mud lines
18.01.07	ability to coordinate activities with third-party contractors

---

Sub-task
18.02 **Cleans out mud tanks.**

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	ND	NV	ND	ND	ND	ND	yes	yes	yes	NV	ND	ND

Supporting Knowledge & Abilities

18.02.01	knowledge of jurisdictional regulations and training requirements for working in confined spaces
18.02.02	knowledge of WHMIS labels and MSDS
18.02.03	knowledge of hazards associated with cleaning mud tanks
18.02.04	knowledge of cleaning sequences and procedures
18.02.05	knowledge of disposal requirements of drilling fluids
18.02.06	ability to select and use tools and equipment
18.02.07	ability to interpret air monitoring devices
18.02.08	ability to coordinate with third-party contractors
18.02.09	ability to perform visual inspection of components such as valves, bridge gate, rubbers and grease lines
18.02.10	ability to recognize, repair and replace worn, damaged and defective components

---

Sub-task
18.03 **Rigs out manifold and flare lines.**

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	ND	NV	ND	ND	ND	ND	yes	yes	yes	NV	ND	ND

Supporting Knowledge & Abilities

18.03.01	knowledge of types and sizes of flare lines
18.03.02	knowledge of components of manifold such as chokes, hoses and valves
18.03.03	knowledge of disassembly sequences for manifold and flare lines
18.03.04	knowledge of hazards associated with rigging out such as weather, terrain, heavy lifting and pinch points

18.03.05	ability to select and use tools and equipment
18.03.06	ability to disconnect manifold and flare lines
18.03.07	ability to store components

Sub-task
18.04 **Rigs out rig floor and related equipment.**

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	ND	NV	ND	ND	ND	ND	yes	yes	yes	NV	ND	ND

Supporting Knowledge & Abilities

18.04.01	knowledge of floor components needed to be rigged out such as tongs, slips, kelly and pipe handlers
18.04.02	knowledge of floor rigging out sequence and procedure according to drilling rig
18.04.03	knowledge of hazards associated with rigging out such as weather, heavy lifting and pinch points
18.04.04	ability to use hand signals
18.04.05	ability to select and use tools and equipment
18.04.06	ability to visually inspect components and equipment
18.04.07	ability to recognize, repair and replace worn, damaged or defective equipment
18.04.08	ability to store components

Sub-task
18.05 **Rigs out pre-fabs.**

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	ND	NV	ND	ND	ND	ND	yes	yes	yes	NV	ND	ND

Supporting Knowledge & Abilities

18.05.01	knowledge of types of pre-fabs such as steel and tarp
18.05.02	knowledge of the sequence of rigging out pre-fabs
18.05.03	ability to use hand signals

18.05.04	ability to select and use tools and equipment such as hand tools and fall arrest equipment
18.05.05	ability to store pre-fabs

Sub-task
18.06 **Lays down derrick.**

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	ND	NV	ND	ND	ND	ND	yes	yes	yes	NV	ND	ND

Supporting Knowledge & Abilities

18.06.01	knowledge of handling (rig out) procedure for types of derricks such as singles, doubles and triples
18.06.02	knowledge of derrick components such as lines and overhead equipment
18.06.03	knowledge of derrick lowering sequences according to drilling rig
18.06.04	ability to select and use tools and equipment
18.06.05	ability to visually inspect derrick
18.06.06	ability to recognize, repair and replace worn, damaged or defective equipment
18.06.07	ability to rig out derrick components such as monkeyboards and lines
18.06.08	ability to spool lines according to rig requirements

---

Sub-task
18.07 **Rigs out mud tanks, pumps and circulation system.**

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	ND	NV	ND	ND	ND	ND	yes	yes	yes	NV	ND	ND

Supporting Knowledge & Abilities

18.07.01	knowledge of types of pumps such as duplex, triplex and submersible
18.07.02	knowledge of mud tank components such as shakers, agitators and lines
18.07.03	knowledge of pump components such as fluid end and power end
18.07.04	knowledge of circulation system components such as lines, valves and hoses
18.07.05	ability to recognize types of mud tanks
18.07.06	ability to select and use tools and equipment

18.07.07	ability to rig out tanks, pumps and circulation systems according to established procedures and sequences
18.07.08	ability to perform visual inspection of components
18.07.09	ability to repair and replace worn, damaged or defective components
18.07.10	ability to store equipment

Sub-task
18.08 **Rigs out boiler and steam circulating system.**

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	ND	NV	ND	ND	ND	ND	yes	yes	yes	NV	ND	ND

Supporting Knowledge & Abilities

18.08.01	knowledge of types of boilers
18.08.02	knowledge of boiler shut-down and cooling procedures and sequences
18.08.03	knowledge of steam circulating system
18.08.04	knowledge of training and certification required to work with boilers
18.08.05	knowledge of components of boilers and steam systems such as lines, safety devices and pop valves
18.08.06	knowledge of hazards associated with working with boilers and steam systems such as superheated high pressure steam and chemicals
18.08.07	ability to visually inspect components
18.08.08	ability to recognize problems associated with improper cooling of boiler
18.08.09	ability to select and use tools and equipment
18.08.10	ability to shut down boiler
18.08.11	ability to remove and replace worn, damaged or defective hoses, valves and pumps

---

Sub-task
18.09 **Rigs out air, fuel and hydraulic lines, and power cables.**

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	ND	NV	ND	ND	ND	ND	yes	yes	yes	NV	ND	ND

Supporting Knowledge & Abilities

18.09.01	knowledge of types of power cables such as 220 volt, 480 volt and 600 volt

18.09.02	knowledge of the sequence for disconnecting air, fuel and hydraulic lines, and power cables
18.09.03	knowledge of jurisdictional regulations regarding power cables
18.09.04	knowledge of training and certification requirements regarding handling and repairing power cables
18.09.05	knowledge of hazards associated with working with power cables and pressurized lines
18.09.06	ability to locate breakers and ensure they are turned off prior to disconnecting power cables
18.09.07	ability to disconnect air, fuel and hydraulic lines, and power cables
18.09.08	ability to recognize differences between air, fuel and hydraulic lines
18.09.09	ability to verify that the power cables are de-energized
18.09.10	ability to recognize worn, damaged or defective air, fuel and hydraulic lines, and power cables
18.09.11	ability to repair air, fuel and hydraulic lines
18.09.12	ability to store air, fuel and hydraulic lines, and power cables according to specific rig procedures

Task 19 Prepares for rig move.

Context

Rig technicians must clean the drilling rig to comply with environmental regulations and company policies. While rig technicians may need to prepare buildings, equipment and components for transport, due to liability issues, third-party transportation contractors are responsible for fastening and securing the loads to the trucks.

Sub-task 19.01 Cleans equipment.

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	ND	NV	ND	ND	ND	ND	yes	yes	yes	NV	ND	ND

Supporting Knowledge & Abilities

19.01.01	knowledge of cleaning material and solvents
19.01.02	knowledge of cleaning priorities

19.01.03	ability to interpret WHMIS labels and MSDS
19.01.04	ability to select and use cleaning tools and materials such as scrub brushes, cleaning solutions and power washers

---

Sub-task
19.02 **Prepares loads for transport.**

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	ND	NV	ND	ND	ND	ND	yes	yes	yes	NV	ND	ND

Supporting Knowledge & Abilities

19.02.01	knowledge of buildings, equipment and components that require preparation for transport
19.02.02	knowledge of load securement guidelines
19.02.03	knowledge of jurisdictional regulations regarding the transportation of loads
19.02.04	knowledge of where equipment and their components are stored for transport
19.02.05	ability to select and use tools and equipment
19.02.06	ability to coordinate with third-party contractors
19.02.07	ability to secure components for transport
19.02.08	ability to recognize, repair and replace worn, damaged or defective securement equipment such as straps, chains and boomers
19.02.09	ability to recognize improperly secured buildings, equipment and components

APPENDICES

APPENDIX A TOOLS AND EQUIPMENT

Hand Tools

adjustable wrenches
banding tools
cable cutter
casing cutters
chain, bench and pipe vises
chain tongs
chisels, punches
cleaning tools (brooms, scrub brushes, etc.)
combination wrenches
crowbar, pinch bar
drill bits
EZ outs
files
flaring tool
hammer wrench
hammers (ball peen, 5 lb. 10 lb. sledge hammer)
hex keys
jacks
levels
limbing saw (swede saw)
oil filter wrench
paint brushes
pipe cutter
pipe threader
pipe wrenches
pliers (locking needlenose etc., channel locks, side cutter)
saws (hacksaw, wood saw, hole saw)
screwdrivers
shovels, spades, picks
snap ring pliers
socket sets
specialty tools for installing, removing jets etc.
taps and dies
torque wrench
vise grips or locking pliers
wire brush

Power Tools, Hydraulic Tools and Pneumatic Tools

chop saws
crimping tools (for hydraulic fittings)
drills
grinders
hydraulic jacks
hydraulic tools (pipe spinners, hawkjaw™)
pneumatic grinder
pneumatic impact tools
power saws (chain, skill, jig)
seat pullers
soldering iron
transfer pump
wash gun

Diagnostic Tools

air monitoring equipment
computers
engine diagnostic tools
ohmmeter
thermometers
voltage meter

Measuring Tools

calipers
measuring tape
meter stick
mud weight scales
nozzle gauge
rulers
thread gauges
torque wrenches
viscosity cups and funnels
water loss press

Rigging, Hoisting and Handling Equipment

chain hoist
chains
clevises
come-along
forklift
grip hoist
hand boomers, ratchet boomers
loader
mobile crane
nylon and cable slings
shackles
snatch block

Personal Protective Equipment and Safety Equipment

aprons
burn kits
derrick harness
eye wash stations
face shield
fall arrest equipment
fire extinguishers
first aid kits
flame retardant coveralls
goggles
hard hats
hearing protection
lock outs
respirators
rubber gloves
safety glasses
self contained breathing apparatus (SCBA)
steel-toed boots
stretchers

Specialized Trade Equipment

float puller
floats
gauge rings
mud can
pipe wiper
rubber roughneck
TOTCO™ rings

APPENDIX B GLOSSARY

For a glossary of terms used in this industry, please refer to the Schlumberger Limited website resource at www.glossary.oilfield.slb.com

The following are definitions of terms used in this analysis which are not found at the above mentioned website resource.

annular	annular blowout preventer: a large valve, usually installed above the ram preventers, that forms a seal in the annular space between the pipe and the wellbore or, if no pipe is present, in the wellbore itself.
bird bath	used to store stands of pipe on rig floor.
bumper block	used to stop drill pipe from going off the end of catwalk when lowered from rig floor.
cat heads	a tool used to provide power to tong to make-up or break-out tubular connections.
catwalk	an elevated walkway at the bottom of the V-door where pipe is laid to be lifted to the derrick floor by the tugger.
chicksan	high pressure steel line with swivel ends.
chocks	wooden blocks used to prevent tubulars from rolling off pipe racks.
core barrel	a tubular device, usually from 3 to 18 metres (10 to 60 feet) long, run at the bottom of the drill pipe in place of a bit and used to cut a core sample.
crown saver	an emergency device to stop traveling blocks from hitting crown.
deadman	anchor for dead line.
flow nipple	connects top of BOP to flow line.
gen-sets	a diesel engine with a generator to produce electricity for the rig.
hydraulicing	drill string moving up in wellbore caused by too much pump pressure in tight hole condition.
iron roughnecks	manufacturer's name for a floor-mounted combination of a spinning wrench and a torque wrench. The iron roughneck moves into position hydraulically and eliminates the manual handling involved with suspended individual tools.
jarring	using a hydraulic tool to provide a hammering force to loosen stuck drill string from wellbore.

keyseat	a groove worn in the side of a deviated wellbore from rotating drill string.
lifting nubbins	used for lifting tubulars to rig floor (pipe, collars etc.).
megajoule (MJ)	the SI unit of service given by a drilling line when it moves 1000 newtons of load over a distance of 1000 metres.
monels	non magnetic drill collar made of monel metal used for directional drilling.
motor kills	emergency shut down for engines.
perforating	to pierce the casing wall and cement of a wellbore to provide holes through which formation fluids may enter or to provide holes in the casing so that materials may be introduced into the annulus between the casing and the wall of the borehole.
perforating gun	a device fitted with shaped charges or bullets that is lowered to the desired depth in a well and fired to create penetrating holes in casing, cement, and formation.
pop valve	pressure relief valve.
rigging in	to prepare the drilling rig for making hole, i.e. to install tools and machinery before drilling is started (also called rig up).
rigging out	to dismantle the drilling rig after drilling has been completed, i.e. to dismantle tools and machinery for moving.
shale bin	open end tank to collect shale from shale shaker.
sloughing	collapsing of the walls of the wellbore (also called caving).
stab	to guide the end of a pipe into a coupling or tool joint when making up a connection.
surface casing	placed in a surface hole to protect ground water, isolate unstable formations and provide a platform for the BOPs.
surface hole	a hole drilled to allow a shallow string of surface casing to be cemented in the ground. It is the first operation for drilling a wellbore.
tour sheet	a tour is a working shift for drilling crews. A tour sheet is the standard report that records each event that takes place at the well site.
tubulars	any kind of pipe. Oilfield tubular goods include tubing, casing, drilling pipe, and line pipe.

APPENDIX C

ACRONYMS

ADR	Automatic drilling rig
BHA	Bottom hole assembly
BOP	Blowout preventer
CAODC	Canadian Association of Oilwell Drilling Contractors
DST	Drill stem testing
DSV	Downhole safety valves
EDR	Electronic drilling recorder
ERP	Emergency response plans
H_2S	Hydrogen sulfide
HCR	Hydraulic-controlled relief
ID	Inside diameter
IRP	Industry recommended practice
JSA	Job Safety Analysis
MACP	Maximum allowable casing pressure
MCC	Motor control centers
MSDS	Material Safety Data Sheet
MWD	Measurement while drilling
NACE	National Association of Corrosion Engineers
OD	Outside diameter
OEM	Original equipment manufacturer
OH&S	Occupational Health and Safety
PJHA	Pre-job hazard assessment
PLC	Programmable logic controllers

PPE	Personal protective equipment
psi	Pounds per square inch
PVC	Polyvinyl chloride
PVT	Pit volume totalizer
rpm	Revolutions per minute
RSPP	Reduced speed pump pressure
SCBA	Self-contained breathing apparatus
SCR	Silicone control rectifiers
spm	Strokes per minute
TD	Total depth
WHMIS	Workplace Hazardous Materials Information System
WOB	Weight on bit

APPENDIX D BLOCK AND TASK WEIGHTING

BLOCK A OCCUPATIONAL SKILLS

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	National Average
%	NV	ND	NV	ND	ND	ND	ND	25	21	21	NV	ND	ND	22%

Task 1 Maintains and uses tools and equipment.

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	
%	NV	ND	NV	ND	ND	ND	ND	15	25	25	NV	ND	ND	22%

Task 2 Organizes work.

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	
%	NV	ND	NV	ND	ND	ND	ND	20	31	31	NV	ND	ND	27%

Task 3 Uses documentation and reports.

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	
%	NV	ND	NV	ND	ND	ND	ND	15	25	25	NV	ND	ND	22%

Task 4 Supervises and trains crew members.

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	
%	NV	ND	NV	ND	ND	ND	ND	50	19	19	NV	ND	ND	29%

BLOCK B RIG MOVES

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	National Average
%	NV	ND	NV	ND	ND	ND	ND	10	6	6	NV	ND	ND	7%

Task 5 Disassembles rig.

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	
%	NV	ND	NV	ND	ND	ND	ND	50	40	40	NV	ND	ND	43%

Task 6 Assembles rig.

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	
%	NV	ND	NV	ND	ND	ND	ND	50	60	60	NV	ND	ND	57%

BLOCK C RIG UP

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	National Average
%	NV	ND	NV	ND	ND	ND	ND	10	10	10	NV	ND	ND	10%

Task 7 Performs rig up procedures.

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	
%	NV	ND	NV	ND	ND	ND	ND	60	73	73	NV	ND	ND	69%

Task 8 Prepares for drilling operations.

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	
%	NV	ND	NV	ND	ND	ND	ND	40	27	27	NV	ND	ND	31%

BLOCK D RIG INSPECTION AND MAINTENANCE

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	National Average
%	NV	ND	NV	ND	ND	ND	ND	25	14	14	NV	ND	ND	18%

Task 9 Inspects rig equipment.

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	
%	NV	ND	NV	ND	ND	ND	ND	60	25	25	NV	ND	ND	37%

Task 10 Maintains rig equipment.

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	
%	NV	ND	NV	ND	ND	ND	ND	40	75	75	NV	ND	ND	63%

BLOCK E DRILLING OPERATIONS

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	National Average
%	NV	ND	NV	ND	ND	ND	ND	20	37	37	NV	ND	ND	32%

Task 11 Prepares drill string.

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	
%	NV	ND	NV	ND	ND	ND	ND	10	12	12	NV	ND	ND	11%

Task 12 Installs blowout preventer (BOP).

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	
%	NV	ND	NV	ND	ND	ND	ND	20	18	18	NV	ND	ND	19%

Task 13 Performs drilling activities.

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	
%	NV	ND	NV	ND	ND	ND	ND	20	15	15	NV	ND	ND	17%

Task 14 Performs tripping activities.

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	
%	NV	ND	NV	ND	ND	ND	ND	20	18	18	NV	ND	ND	19%

Task 15 Performs casing activities.

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	
%	NV	ND	NV	ND	ND	ND	ND	10	12	12	NV	ND	ND	11%

Task 16 Performs specialized drilling operations.

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	
%	NV	ND	NV	ND	ND	ND	ND	10	7	7	NV	ND	ND	8%

Task 17 Performs specialized well operations.

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	
%	NV	ND	NV	ND	ND	ND	ND	10	18	18	NV	ND	ND	15%

BLOCK F RIG OUT

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	National Average
%	NV	ND	NV	ND	ND	ND	ND	10	12	12	NV	ND	ND	11%

Task 18 Performs rig out procedures.

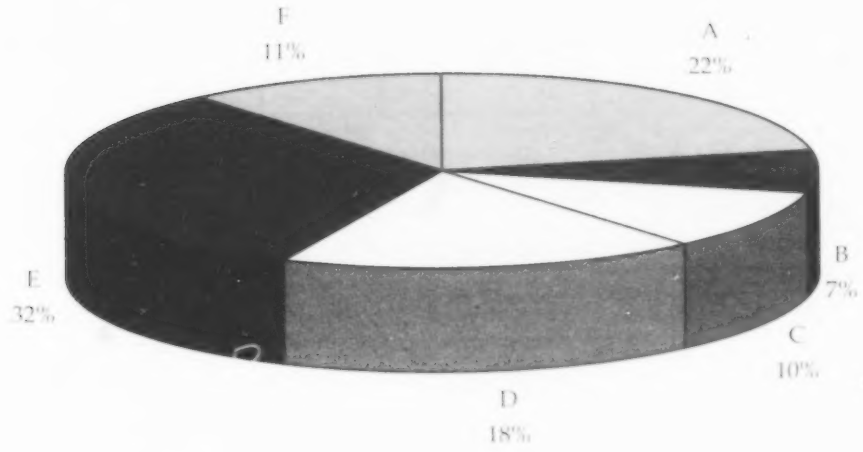
	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	
%	NV	ND	NV	ND	ND	ND	ND	80	82	82	NV	ND	ND	81%

Task 19 Prepares for rig move.

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	
%	NV	ND	NV	ND	ND	ND	ND	20	18	18	NV	ND	ND	19%

APPENDIX E

PIE CHART*



TITLES OF BLOCKS

BLOCK A	Occupational Skills	BLOCK D	Rig Inspection and Maintenance
BLOCK B	Rig Moves	BLOCK E	Drilling Operations
BLOCK C	Rig Up	BLOCK F	Rig Out

* Average percentage of the total number of questions on an interprovincial examination, assigned to assess each block of the analysis, as derived from the collective input from workers within the occupation from all areas of Canada. Interprovincial examinations typically have from 100 to 150 multiple-choice questions.

APPENDIX F — TASK PROFILE CHART — Rig Technician

	BLOCKS	TASKS	SUB-TASKS				
A	OCCUPATIONAL SKILLS	1. Maintains and uses tools and equipment.	1.01 Maintains hand and power tools.	1.02 Uses mobile equipment.	1.03 Uses manual rigging equipment.	1.04 Uses personal protective equipment (PPE) and safety equipment.	
		2. Organizes work.	2.01 Communicates with others.	2.02 Maintains parts and supply inventory.	2.03 Disposes of waste materials.	2.04 Maintains safe work environment.	2.05 Leads crew meetings.
		3. Uses documentation and reports.	3.01 Uses personnel documentation.	3.02 Uses safety and environmental documentation.	3.03 Completes tour sheets.	3.04 Interprets trade documentation.	
		4. Supervises and trains crew members.	4.01 Supervises crew members.	4.02 Orients new crew members to rig.	4.03 Trains crew members.		
B	RIG MOVES	5. Disassembles rig.	5.01 Removes components.	5.02 Cleans site.			
		6. Assembles rig.	6.01 Prepares site for rig up.	6.02 Assembles sub, derrick and drawworks.	6.03 Spots buildings and equipment.		
C	RIG UP	7. Performs rig up procedures.	7.01 Runs air, fuel and hydraulic lines, and power cables.	7.02 Starts and warms up equipment.	7.03 Raises derrick.	7.04 Rigs up rig floor and related equipment.	7.05 Installs pre-fabs.
			7.06 Rigs up mud tanks, pumps and circulation system.	7.07 Installs conductor and flow lines to shakers.	7.08 Sets up boiler and steam circulating system.		

BLOCKS	TASKS	SUB-TASKS				
	8. Prepares for drilling operations.	8.01 Checks condition of drilling components.	8.02 Mixes drilling fluid.	8.03 Drills mousehole and rathole.		
D RIG INSPECTION AND MAINTENANCE	9. Inspects rig equipment.	9.01 Performs daily walk-around inspection.	9.02 Performs detailed rig inspection.	9.03 Determines required repairs.		
	10. Maintains rig equipment.	10.01 Maintains mechanical systems.	10.02 Maintains hydraulic systems.	10.03 Maintains pneumatic systems.	10.04 Maintains electrical systems.	10.05 Maintains boiler.
		10.06 Maintains overhead equipment.	10.07 Maintains floor equipment.	10.08 Maintains drilling fluid circulating systems.	10.09 Maintains water, steam and fuel circulating systems.	
E DRILLING OPERATIONS	11. Prepares drill string.	11.01 Makes up bottom hole assembly (BHA).	11.02 Picks up and lays down collars.	11.03 Monitors surface hole conditions while drilling.		
	12. Installs blowout preventer (BOP).	12.01 Prepares for BOP installation.	12.02 Assembles BOP equipment and associated components.	12.03 Pressurizes BOP accumulator.	12.04 Pressure tests BOP.	
	13. Performs drilling activities.	13.01 Maintains drilling fluids.	13.02 Operates drilling equipment.	13.03 Monitors drilling conditions and equipment.	13.04 Maintains pipe tally.	13.05 Surveys wellbore.
	14. Performs tripping activities.	14.01 Prepares for trip.	14.02 Trips drill string and BHA.	14.03 Performs slip and cut.	14.04 Lays down pipe and collars.	
	15. Performs casing activities.	15.01 Prepares casing.	15.02 Installs casing equipment.	15.03 Runs casing.	15.04 Cements casing.	
	16. Performs specialized drilling operations.	16.01 Performs coring activities.	16.02 Performs directional drilling.	16.03 Performs underbalanced / air drilling.		

BLOCKS	TASKS	SUB-TASKS				
	17. Performs specialized well operations.	17.01 Performs fishing and stuck pipe operations.	17.02 Performs sour well operations.	17.03 Performs well control operations.	17.04 Rigs wireline loggers in and out.	17.05 Handles test tools.
		17.06 Runs packers and bridge plugs.	17.07 Completes the well for production.	17.08 Completes the well for abandonment.		
F RIG OUT	18. Performs rig out procedures.	18.01 Drains fluids.	18.02 Cleans out mud tanks.	18.03 Rigs out manifold and flare lines.	18.04 Rigs out rig floor and related equipment .	18.05 Rigs out pre-fabs.
		18.06 Lays down derrick.	18.07 Rigs out mud tanks, pumps and circulation system.	18.08 Rigs out boiler and steam circulating system.	18.09 Rigs out air, fuel and hydraulic lines, and power cables.	
	19. Prepares for rig move.	19.01 Cleans equipment.	19.02 Prepares loads for transport.			